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MIXED RADIOACTIVE AND HAZARDOUS WASTE DISPOSAL ISSUES

JOINT HEARING

BEFORE THE

SUBCOMMITTEES ON
NUCLEAR REGULATION AND
ENVIRONMENTAL POLLUTION

OF THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

NINETY-NINTH CONGRESS

SECOND SESSION

ON

S. 892

A BILL TO AMEND THE SOLID WASTE DISPOSAL ACT TO CLARIFY THE JURISDICTION OF THE ENVIRONMENTAL PROTECTION AGENCY OVER THE REGULATION OF SOLID WASTE MIXED WITH RADIOACTIVE MATERIALS AT DEPARTMENT OF ENERGY ATOMIC ENERGY ACT FACILITIES

MARCH 25, 1986

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MIXED RADIOACTIVE AND HAZARDOUS WASTE DISPOSAL ISSUES

TUESDAY, MARCH 25, 1985

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEES ON NUCLEAR REGULATION AND
ENVIRONMENTAL POLLUTION,
Washington, DC.

The subcommittees met, pursuant to notice, at 10:02 a.m., in room SD-406, Dirksen Senate Office Building, Hon. Alan K. Simpson (chairman of the Subcommittee on Nuclear Regulation) presiding.

Present: Senators Simpson, Stafford, and Domenici.

OPENING STATEMENT OF HON. ROBERT T. STAFFORD, U.S. SENATOR FROM THE STATE OF VERMONT

Senator STAFFORD. We are meeting this morning in a joint hearing. I was tempted to say, at first, that this would be the lion and the lamb sitting down together, but in view of the character of the two subcommittee chairmen, I will say, it is the lion and the tiger who will be together this morning, the Subcommittee on Nuclear Regulation and the Subcommittee on Environmental Pollution. I understand that none of the existing low-level radioactive waste disposal sites presently is accepting mixed wastes, I, therefore, am interested in finding out what is being done with commercial mixed wastes. Specifically, are these wastes being disposed of or treated in a manner that provides equivalent or greater protection to the public and to the environment than land disposal?

I would like the appropriate witnesses to address this question, and also whether alternatives to land disposal can be a safe, long-term option for these mixed wastes.

There has been some discussion of prohibiting the disposal of mixed wastes at low-level radioactive waste disposal facilities in order to prevent regulatory uncertainty or conflicts between the agencies from potentially delaying the siting process for new low-level radioactive waste disposal facilities.

Others have proposed legislative or administrative solutions to the problem of regulatory uncertainty and conflict. In discussing such changes, and in examining the existing system, we must remember that the primary consideration must always be given to the protection of the public health, and safety, and the environment. Considerations of expediency or jurisdictional disputes should not be allowed to compromise this protection.

This hearing will also examine the application of RCRA to mixed wastes at the Department of Energy facility. I am particularly interested in comments on the application of RCRA to the hazardous component of what DOE has proposed to call byproduct material.

For example, why shouldn't RCRA apply to these hazardous components in the same manner as it applies to the hazardous components of other DOE waste streams?

That will conclude my opening remarks. I am delighted that the chairman of the Subcommittee on Nuclear Regulation, Senator Simpson, is here.

Senator, I will yield the floor. The gavel is all yours.

OPENING STATEMENT OF HON. ALAN K. SIMPSON, U.S. SENATOR FROM THE STATE OF WYOMING

Senator SIMPSON. Mr. Chairman, I do appreciate the remarkable support and cooperation you have given to me as I chair the Subcommittee on Nuclear Regulation. You have been marvelous in allowing us to go forward with what we need to do. I am personally deeply appreciate always.

My remarks are very short. Today, we have the Subcommittee on Nuclear Regulation and the Subcommittee on Environmental Pollution meeting in joint session to consider this issue of mixed hazardous and radioactive waste regulation.

That issue is one in which the Subcommittee on Nuclear Regulation, which I chair, has had a very longstanding interest, arising out of our jurisdiction over the activities of the Nuclear Regulatory Commission under the Atomic Energy Act.

My fine friend from Rhode Island, John Chafee, as the chairman of the Subcommittee on Environmental Pollution, has a great interest in this issue and possesses considerable expertise.

We thought that it might be appropriate and efficient for us to join together today in this hearing, considering what steps, if any, need to be taken, either by Congress or the agencies, to clarify the regulatory framework for the disposal of wastes that contain both hazardous and radioactive materials.

I think we all feel strongly that whatever we do, we must ensure that the public health and safety is being protected from those risks posed by both hazardous and radioactive materials contained in these mixed wastes.

The difficult question for us, at least in my experience in chairing this subcommittee, is how best do we fashion an effective and efficient approach. This is what we will do today, in addition to the work of this committee last year on the low-level waste bill. The majority and the minority reached a consensus, through some fine staff work, on that. It was a pleasure to be part of that. It was subsequently endorsed by the full Senate on how to handle mixed waste at low-level waste facilities. We will also be considering today the bill of Senator John Glenn, S. 892, to clarify the application of RCRA to the Department of Energy facilities.

I know of your great interest in this, Senator Glenn, and in particular of the very troubling situation that you face in Ohio with regard to the DOE facilities.

I appreciate very much your agreement, last December, which allowed us to defer consideration of this issue until now, rather than to deal with it in the low-level waste bill in the closing hours of the last session. A promise kept, of course, and I thank you for that.

I look forward to your testimony and to be working with you in an effort to resolve this issue.

Thank you, Mr. Chairman.

STATEMENT OF HON. JOHN GLENN, U.S. SENATOR FROM THE STATE OF OHIO

Senator GLENN. Thank you, Mr. Chairman.

I want to thank you very much for holding this hearing. We have discussed this before, as you indicated. I appreciate the opportunity to testify.

The subject of mixed wastes has been a vexing one in general and for this committee in particular. How to sort out the overlapping jurisdictions between EPA and NRC in the case of licensed nuclear facilities, and between EPA and DOE in the case of Government-owned nuclear facilities is not a simple one, but it must be done if we are to avoid partial paralysis of our statutory programs for the regulation of hazardous wastes.

My testimony, Mr. Chairman, is focused on what I believe to be the most critical component of the mixed waste issue, and that is the regulation of such waste at DOE sites where materials and components for nuclear weapon production are created and processed, machined, tested, and assembled.

For over 40 years, DOE and its predecessor agencies have self-managed, without oversight from other agencies, the treatment, storage, and disposal of defense-related wastes. Some of DOE's waste disposal methods predate current environmental laws and regulations and have involved such questionable practices as draining liquid radioactive, hazardous, and mixed wastes into unlined ponds or cribs, and dumping such solid waste into open, unlined trenches or burial grounds. In all fairness, I would add that in many cases they have operated in good faith, but we have a lot more information now in some of these areas than we did previously.

The results for environmental protection should not be surprising. There is widespread contamination of ground water at various DOE sites involving nitrates, solvents, uranium, and, in the case of Hanford, strontium-90. There is soil contamination, including high levels of mercury at the Y-12 plant in Oak Ridge; uranium at the feed materials production center at Fenald, OH; elevated levels of plutonium in soil at the Savannah River facility in South Carolina; and offsite plutonium in soil at the Rocky Flats facility in Colorado.

To this should be added the presence of significant PCB contamination problems at a number of sites, including the Portsmouth nuclear enrichment facility at Piketown, OH.

The details of contamination at the Ohio facilities of DOE were presented in a report to me by the General Accounting Office in December of last year, and a comprehensive report on all the

major DOE facilities will be presented to me by the GAO in about 3 months.

In my view, Mr. Chairman, it is not an exaggeration to say that the environmental problems at our DOE nuclear weapon production facilities have reached the dimension of very major national problems. There is no justification for risking the poisoning of our own people in order to meet the concerns to our security generated by the Soviet Union.

The Department of Energy, under Secretary Harrington's leadership, is beginning to address this massive problem, and I want to compliment them for that. They are taking action in this area, and that is good. It has been long overdue, so we are glad to see it start. But there are no shortcuts in overcoming a 40-year record of neglect by AEC, ERDA, and DOE. Mitigation of the results of that neglect will take much effort, possibly requiring billions of dollars.

One of the first steps in any program of environmental protection and cleanup is to be clear about who has the responsibility for setting and enforcing standards. In the case of radioactive materials unmixed with other hazardous materials, the Atomic Energy Agency gives DOE the authority to police itself. In the case of hazardous materials, uncontaminated by radioactivity, the Resource Conservation and Recovery Act, RCRA, gives EPA the authority to regulate use, storage, and disposal at all the sites, including those of DOE. The individual States may also add their own standards to those of EPA, and in accordance with an approved hazardous waste program, may also act as an enforcement agent for EPA, as well as themselves, under RCRA.

The bone of contention is in the area of mixed wastes. These wastes frequently contain corrosive acids and carcinogenic solvents, in addition to radioactive materials. The health risks from the hazardous chemical constituents of mixed wastes often outweigh the dangers from the associated radioactivity. Nonetheless, questions have arisen which have yet to be settled regarding the regulatory jurisdiction over mixed waste.

Both the Atomic Energy Act and RCRA agree on DOE's regulatory primacy over source material, special nuclear material, and byproduct material. On the other hand, RCRA clearly has exclusive jurisdiction over hazardous chemical wastes. In addition, section 1006(a) of RCRA states that it does not apply to any activity or substance that is subject to the AEA "except to the extent that such application or regulation is not inconsistent with the requirements of" the AEA.

This is really the crux of the issue. Many believe that it would not be inconsistent with the requirements of the AEA for all mixed wastes to be subject to RCRA. DOE disputes this and is making an attempt to distinguish between mixed wastes subject to RCRA and all other mixed wastes on the basis of a proposed administrative change in the definition of byproduct material.

At present, byproduct material is defined in the AEA as any radioactive material, except special nuclear material, yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material.

DOE proposes to clarify this definition by introducing notions of direct process waste and indirect process waste. Direct process

wastes are those in which the contained radioactivity is a direct, necessary, and inherent consequence of the process of producing and utilizing special nuclear material. It is these wastes that DOE proposes to call byproduct material.

Examples of such byproduct material would be the high-level radioactive waste emanating from the chemical processing of spent fuel for the production of plutonium, and the radioactive waste of cutting oil used in the machining of plutonium to a usable configuration. Such materials would not, then, be subject to RCRA under the DOE definition of byproduct material.

The indirect process wastes in which the contained radioactivity is at best an indirect consequence of the process for processing and utilizing special nuclear material would contain byproduct material, but would not be considered byproduct material in their entirety. If they contain hazardous wastes, they would be considered mixed wastes, and RCRA would apply to the hazardous waste component, while the AEA would apply to the byproduct material component.

The implementation of regulations pursuant to these definitions would follow the listing and description by DOE of all waste streams at its facilities and their classification by DOE as byproduct material or mixed waste as appropriate.

Mr. Chairman, there are many things to say about DOE's proposal, but I have limited myself to a few salient comments.

First, the DOE proposal enlarges the definition of byproduct material to include situations where a nonradioactive substance is mixed with a radioactive one. The only precedent for this enlargement is in the Uranium Mill Tailings Radiation Control Act of 1978, where the Congress amended the AEA to define byproduct material as including "the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content."

This was done in order to subject uranium mill tailings to the AEA, and to ensure that any associated mixed wastes would be subject to AEA rather than RCRA. The point is that Congress felt that it had to have legislation in order to enlarge the definition of byproduct material to include nonradiological wastes.

I do not believe that DOE has the authority to enlarge the definition by a purely administrative action.

Second, under the proposed definition, low-level radioactive waste can be classified as byproduct material even though most of the waste may be composed of hazardous waste constituents. Such constituents may pose more of a threat to human health and safety than the radioactivity of the material, yet DOE would not be required to satisfy the provisions of RCRA in the handling of such materials.

Third, it appears that DOE wants to have its cake and eat it too. It defines direct process waste as byproduct material, thereby excluding RCRA from jurisdiction over such mixed waste, but does not allow full RCRA jurisdiction over indirect processed waste because they contain byproduct material.

In addition, the whole question of what distinguishes a direct process from an indirect process is fuzzy at best. Cutting oil laced with plutonium from a machining process, which is considered by

DOE as a direct process waste, could just as easily be considered an indirect process waste in the utilization of plutonium because there are alternatives to using cutting oil.

When one considers that what DOE would classify its own waste streams, it is apparent that DOE wants to be able to determine for itself what will be subject to RCRA, and what will not.

Fourth, the Nuclear Regulatory Commission staff has filed strong objections to the proposed DOE rulemaking. In a letter to DOE by the Director of the Division of Waste Management at NRC, it was stated that:

> NRC staff believes that the proposed DOE rulemaking could have a significant and unacceptable impact on the regulatory program of NRC and the Agreement States. If the proposed DOE definition of byproduct material were found to be applicable to NRC, we believe that it would effectively remove from NRC and Agreement State jurisdiction the disposal of wastes with significant radiological hazards that have heretofore been under our regulatory control.

In addition, the NRC staff comments on the proposed rulemaking characterized DOE's new concept of byproduct material as contradicting 40 years of accepted regulatory understanding. It is of particular concern to me that the NRC staff believes that the proposed rulemaking could result in the loss of their jurisdiction over some possession and use of special nuclear material, as well as byproduct material, and this could raise important strategic and safeguards problems.

The fifth point. DOE has argued that its voluntary mixed waste management under the AEA has been consistent with RCRA, and that its proposed rulemaking will make no difference in the protection accorded to the environment and U.S. citizens. While there is no doubt that DOE has become more sensitive to these issues, and I compliment them for that, the past record of the agency is such that it is essential that DOE be required by law to comply with RCRA when handling mixed wastes. Any redefinition of byproduct material that prevents this from happening is, in my view, not in the public interest.

Mr. Chairman, my testimony makes apparent my position on the mixed waste issue as it applies to DOE sites. I believe that RCRA should apply to all mixed wastes, except where there are de minimis quantities of nonradiological hazardous materials involved.

Nearly a year ago, on April 4, 1985, I introduced S. 892, the Mixed Hazardous Waste Amendment Act. This bill, Mr. Chairman, would make all mixed wastes at DOE sites subject to RCRA. There may be some refinements, some redrafting needed to ensure the bill does everything that is intended. In any case, I would urge the Environment and Public Works Committee to markup the legislation on this issue this year so that we can finally turn around the environmental difficulties that the nuclear weapons program has produced.

I believe that the issue deserves a top priority on the Nation's environmental agenda.

I would add, Mr. Chairman, that the National Governors Association has endorsed the principle. They have not specifically named this bill, but they have endorsed the principle of applying RCRA to all mixed wastes at all of these facilities.

I would also ask that it be included in the record, Mr. Chairman, a little fact sheet that I have here that was part of the GAO study. It involves just Hanford, and I put it in just to give some examples of the enormity of the problem that we are up against. High-level waste at Hanford right now, under the different categories of fluids, sludge, slurries, salt cake, and capsules, and so on, there are some 300,000 cubic meters of high-level waste there that are stored in some 149 separate single-shell tanks. There are a lot of figures here that I won't bother to read, but if you come down to transuranic, there are some 200,000 cubic meters. If you come down to low-level wastes, and of the low-level wastes stored at Hanford, liquids are 195 billion—"b" boy billion—195 billion gallons in 277 different sites, and of solids, 8.4 million cubic feet. This is an enormous problem, and this is just at one site. 90 percent of the material is in 340 inactive sites, and it is mixed wastes. So it indicates the enormity of the problem that we are up against.

There are some other figures here, but I would ask that this be entered into the record as part of my testimony.

Senator SIMPSON. Without objection, it will be made part of the record.

Senator GLENN. Mr. Chairman, I will be glad to answer any questions.

I would also like to have the Chair's permission to have join me at the table, if there are questions, Dr. Len Weiss who has worked on this problem for a long time. If there are questions, I would ask that he be permitted to join me.

[The information submitted for the record by Senator Glenn follows:]

Type of Waste	Amount	Disposal Practices		
		Past	Current	Future
		1944-1970	1970-today	1990s
High-level				
Liquids				
Fluid	32,100 cubic meters	149 single shell tanks	double shell tanks: 20 active, 8 CY 1986, 4 budgeted for FY1987	Vitrification after separating high-level and low-level waste. Some low-level waste will be made into a cement-like mixture and buried.
Sludge	46,800 cubic meters			
Slurry	58,000 cubic meters			
Salt Cake	95,700 cubic meters			
Capsules:				
Cesium	1,500			
Strontium	650			
Solids	None			
		1944-1970	1970-today	1988 on
Transuranic				
Stored (CH&RH)	13,716 cubic meters	Disposed with low-level waste in shallow pits	Retrievably stored pending geologic repository	Process, package, and send to WIPP
Buried	91,660 cubic meters			
Soil	68,700 cubic meters			
		1944 - - - - - - - - - - - - -today		Unknown
Low-level				
Liquids	195 billion gallons	Disposed in cribs, ponds, trenches, ditches, and french drains--there are 27 active and 277 inactive--per DOE.		Depends on the outcome of EIS and a study to comply with DOE Order 5820.2.
Solids	8.4 million cubic feet	Buried in shallow pits or trenches. Per DOE, there are 63 inactive and 14 active burial sites.		In-situ vitrification being considered for some old sites.

Hazardous only			1985- - - - - - - - - - - - - - - - - -	
Liquids	3,997 gallons as of January 1986.	Until 1985 - some disposed in solar evaporation basins (4)	Off-site disposal	
Solids	17,600 pounds	Landfill	Landfill	
Mixed waste		1944 - - - - - - - - - - - - - - - -today		Unknown
Solids	To be determined.	Disposed in low-level burial grounds.		Results of RCRA Part B application and by-product redefition could affect long-term disposal practices.
Liquids	To be determined.	Disposed in cribs, ponds, trenches, ditches, and french drains.		

Senator SIMPSON. John, thank you very much. This was very important testimony. I had read it, and now I have heard it. There are some serious things that we will address.

I don't know that I have any questions of you. I think we will save the questions I have for the two panels that will be before us in a moment.

I certainly invite you to participate in any way you wish, asking questions, or anything of that nature. I personally appreciate very much what you have done, and I will say again how much I appreciate the forebearance as we dealt with the low-level issue before. I hope that we can meet some of your very sensible concerns here.

Senator GLENN. Thank you, Mr. Chairman.

Senator SIMPSON. Thank you very much, and thank you, Mr. Weiss.

Now we will have the panel consisting of John Barker, the Director of the Environmental Audit and Compliance, U.S. Department of Energy; Marcia A. Williams, Director, Office of Solid Waste, U.S. Environmental Protection Agency; and John G. Davis, Director of the Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission.

Welcome to the hearing this morning. If you will please proceed. I believe you have been advised that there is a time constraint, and we have set that at approximately 7 minutes. Thank you very much.

Mr. Barker, you are first on the list.

STATEMENT OF JOHN R. BARKER, DIRECTOR, OFFICE OF ENVIRONMENTAL AUDIT AND COMPLIANCE, DEPARTMENT OF ENERGY, ACCOMPANIED BY WILLIAM H. MELLOR III, DEPUTY GENERAL COUNSEL, LEGISLATION AND REGULATIONS

Mr. BARKER. Good morning, Mr. Chairman, and members of the subcommittee. I am John Barker, Director of the Office of Environmental Audit and Compliance at the Department of Energy. With me today is William H. Mellor III, the deputy general counsel for legislation and regulations at the Department of Energy.

I appreciate the opportunity to provide DOE's views on the proposed bill, Senate bill 892. The appropriate regulation of mixed waste is a subject of great interest to the Department.

The administration does not have a current position on the bill, and we are in the process of formulating a position through joint meetings with NRC and with EPA. However, we believe that the current law provides an adequate framework for the regulation of mixed waste.

Its bifurcation of responsibility would seem to be preferable, because in distinguishing between hazardous solid waste, which is subject to EPA regulation under RCRA, and source, special nuclear, and byproduct material which is subject to DOE jurisdiction under AEA, current law ensures that each type of waste will be regulated by the agency with the appropriate expertise.

DOE believes that the abandonment of this distinction would complicate the important task of integrating the requirements of RCRA with those of the Atomic Energy Act so as to maximize the

protection of the environment from both chemical and radiation hazards.

As set forth in the Secretary's policy statement of January 8, 1986, it is the policy of the Department to conduct its operations in compliance with the letter and the spirit of applicable environmental statutes, regulation and standards.

In furtherance of that policy, the Department is actively implementing the Resource Conservation and Recovery Act at its facilities. We are faced with a complex situation because some of our wastes involve mixtures of radioactive materials that we are responsible for under the Atomic Energy Act, and chemically hazardous wastes that are under the jurisdiction of EPA and the States pursuant to RCRA.

We are responding to this and other environmental protection challenges that we face with a set of new initiatives. These new initiatives are the result of a thorough and independent review of the Department's environment, safety, and health function.

First in the order of those initiatives, the oversight responsibility for the environment, safety, and health function in the Department has been consolidated and upgraded under the new position of an Assistant Secretary for Environment, Safety and Health. In that capacity, the ES&H organization is now integrally involved in the operation of the Department at all levels with regard to the environmental and safety aspects of ongoing operations and necessary corrective actions.

Second, ES&H will conduct a baseline environmental survey of all DOE facilities to identify Department-wide existing environmental problems and areas of potential risk and to prioritize corrective action. The onsite survey activities scheduled to begin in fiscal year 1986 will take about 3 years to complete and will enable the Department to develop long-range planning for correcting environmental problems and reducing potential risks.

Third, ES&H will conduct technical safety appraisals of DOE's nuclear facilities to determine compliance with safety requirements, application of industry lessons learned, and comparability with licensed facility requirements. These will be onsite technical appraisals of all aspects of safety, nuclear reactor safety, nuclear process facility safety, health physics, training, emergency preparedness, occupational medicine, and transportation, and packaging. The technical safety appraisals have already begun in February 1986, and they will be completed in 3 years.

Other elements of the Department's strengthened environment, safety, and health program include regular field reporting and a computer assisted tracking system, a more aggressive ES&H role in the development and implementation of environmental and safety policies for the Department, including more detailed Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act policy guidance, enhanced liaison with State and Federal agencies, and coordination of departmental environmental activities such as compliance with RCRA and CERCLA requirements.

The new initiatives represent the Secretary's personal commitment to a quality environment, and to the safety, and health of our workers and all Americans. These initiatives assure that the De-

partment has solid information upon which to base its cleanup and corrective actions, and strong oversight to ensure continued safe and environmentally sound operations.

If I may address directly the DOE hazardous waste situation. Under the current framework, with respect to hazardous waste management activities, DOE facilities are required to be permitted under RCRA, which establishes cradle-to-grave regulation of hazardous waste. Similar cradle-to-grave regulation of radioactive waste is required by the AEA, the Atomic Energy Act of 1954, and implemented through DOE orders.

With regard specifically to DOE's hazardous and mixed waste activities, some background information may be helpful in understanding the history of DOE's RCRA compliance efforts. Section 1006(a) of RCRA provides that that act does not apply to activities or substances which are subject to the Atomic Energy Act, except to the extent that RCRA's application would not be inconsistent with the Atomic Energy Act's requirements.

On the basis of this provision in RCRA, the Department originally believed that its defense weapons production facilities were not subject to regulation under RCRA, because it was believed at that time that the application of RCRA to the defense weapons production facilities would be inconsistent with the provisions of AEA which authorizes DOE to regulate its activities so as to protect the health and minimize danger to life or property. In addition, the Department believed that some aspects of the RCRA permitting program were inconsistent with its responsibility under the AEA to protect the integrity of classified information.

In 1984, in the case of *L.E.A.F.* v. *Hodel,* in the eastern district of Tennessee, the U.S. District Court found that DOE's interpretation of section 1006(a) was unnecessarily broad. The court found that there was no inherent general inconsistency between RCRA and AEA, and that section 1006(a) required RCRA to give way only in specific instances in which DOE cannot comply with the requirements of both statutes.

DOE did not seek to appeal that decision, on the contrary, we implemented it. Although the court's opinion focused only upon nonradioactive hazardous waste, and even stated that nuclear waste was exempt from RCRA, DOE decided not to contest RCRA's applicability to mixed waste either, mixed waste being hazardous waste mixed with radioactive waste.

Because of the dual character of mixed waste, DOE considered it prudent that this waste be subjected to dual regulation—regulation under RCRA to guard against its chemical hazard and regulation under the AEA to guard against its radiological hazard.

Consistent with this approach, DOE facilities were directed to seek RCRA permits, both for nonradioactive hazardous waste and for waste determined to be mixed waste.

RCRA provides an exclusion from the definition of solid waste, and thus hazardous waste, for source, special nuclear, and byproduct material.

The terms "source, special nuclear, and byproduct material" had not been used previously as waste-related terms, so that at the time of RCRA's passage, there was no existing understanding of the meaning of these terms in the context of waste.

As a practical matter, the AEA's definitions of source material, and special nuclear material presented no difficulty in interpretation. The statutory definition of byproduct material, however, does present some difficulty in interpretation. For this reason, DOE proposed an interpretative rule to clarify which DOE wastes are byproduct material and are therefore not subject to RCRA. That proposed rule was published in November 1985 and the Department is currently evaluating public comments on the proposed rule, including those comments—if I might add to my written statement—questioning the need, purpose, and the basis for the proposed rule.

As mentioned above, with respect to the mixed waste, DOE has agreed that such wastes are subject to regulation by EPA and the States under RCRA. Also, in recognition that the States have had this authority under RCRA, DOE is involving them now in mixed waste management issues. When States have EPA authorized programs covering mixed waste, we will obtain the necessary permits from them as well as for our operations.

This concludes my prepared statement. I believe I have gone over a little bit, and I apologize. I will be glad to answer any questions that you might have.

Senator SIMPSON. I thank you very much, Mr. Barker.

Now Marcia Williams, please.

STATEMENT OF MARCIA A. WILLIAMS, DIRECTOR, OFFICE OF SOLID WASTE, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY MARK GREENWOOD, ASSISTANT GENERAL COUNSEL

Ms. WILLIAMS. Good morning, Mr. Chairman. I am Marcia Williams, Director of the Office of Solid Waste at EPA. With me is Mark Greenwood, our assistant general counsel for the RCRA Program in EPA.

We appreciate the opportunity to appear before you today to discuss EPA's activities related to mixed waste and radioactive waste.

My written testimony discusses a number of items. It talks about the various types of radioactive wastes; the regulatory authorities for addressing them by DOE, NRC, and ourselves; some of the difficulties that we have encountered; what we believe can be fixed through regulation; what are some of the areas where we believe we won't get fixes with regulation, but need some minor statutory changes. Then it outlines some possible statutory changes.

In the interest of time, what I would like to do this morning is to focus my oral comments on some of the difficulties we have encountered and some possible next steps.

I would like to state at the front of this, though, that these are not easy issues. I think that while all agencies do have the same goal, which is to protect health and safety, it is often difficult to determine how to best provide protection from a waste that causes and results in two different kinds of hazards.

We have been meeting with both DOE and NRC on these issues during the last 2 months, and we are continuing to do so, to see if we can't make further progress.

Let me begin by identifying a few of the problems and difficulties between the NRC and EPA to date.

First, I think, is the situation of dual permitting and enforcement which is not an optimal situation from anyone's perspective. By that I mean, the Federal perspective or the State perspective, because different agencies have different organizations in their State that have the lead for activities in the regulated industry.

Second, there is conflicting philosophy on how best to protect health and environment from the different hazards. In terms of the radioactive hazard, and the philosophy behind that, NRC has used a philosophy of trying to get geologic attenuation, taking care of geologic attenuation and containerization, and location standards so that the waste is contained until such time as it decays. They are also concerned about minimizing worker exposure.

Under RCRA, for hazardous waste, the philosophy has been somewhat different. It has been a philosophy of collecting leachates, banning liquids, and essentially keeping the waste out of ground water and the environment, cleaning it up as it gets into the ground water and environment.

One of the things that we have been wrestling with is how to come to grips with these two different philosophies for how to best protect health and the environment.

A third issue is the fact that waste naturally occurring and accelerated produced radioactive material [NARM] is not covered by the AEA, the Atomic Energy Act, and does not lend itself in a lot of ways to listing by the RCRA Program, although it, in fact, could be covered under the RCRA Program.

Until the completion of the Brookhaven report, which NRC did complete toward the end of last year, we really didn't have a good sense of the type or the quantity of the waste that we were dealing with.

Another problem that we have had is the impact moving RCRA targets will have on the State compacts that NRC is trying to get into place. This is a problem because, as you know, we have in front of us now a very ambitious agenda with regard to RCRA over the next couple of years coming out of the 1984 RCRA Amendments. To some degree, we are dealing with a moving target.

The last problem or difficulty that I would like to mention is the fact that we have not yet delegated to RCRA States the authority for permitting of NRC wastes under the RCRA Program, and we have not done that because of the difficulties that I have outlined with these other problems. That is something that can be done, but we felt that it would be useful to resolve the other issues first.

Shifting to some of the difficulties we have had with DOE situation. I think that John has already touched on several of these already, the fact that we need a byproduct definition in front of us so that we can go ahead and know what is mixed waste, second, national security concerns; third, the same types of conflicting regulatory approaches with regard to how to manage chemical and radiation hazards; and, finally, the same issue with regard to delegation of RCRA to the States.

Let me turn to what I think can be done today through regulation or policy changes.

First, I believe that we and DOE can work to get the definition of byproduct into place and, therefore, that will clarify what is mixed waste. EPA feels that that can be done either through the regula-

tion that DOE is working on, or it can be done without the regulation through clearcut policy addressing of the individual waste streams.

Second, we now have a draft of a rule to address the national security issues under section 1006. We are also in the process of finalizing our draft of a proposed rule to address RCRA waivers in cases where RCRA does prevent health protection from radiation hazards. That particular rule is one in which we will be trying to do a comparative risk assessment to make sure that we know which of the two wastes causes the larger risk concern in a particular case.

As soon as those things are finished, we can move ahead and delegate the RCRA to authorized States.

Finally, the thing I wanted to mention that I believe we can do without any further regulation or statutory changes, we can continue to encourage the minimization of the production of mixed wastes through different types of generator controls, which we believe hold a lot of promise.

There are, however, a couple of items that we do not believe lend themselves to regulatory fixes. One of those is the dual permitting/enforcement situation between EPA and NRC. The second item is the ability to do some kind of special standard to handle NARM waste in an optimal way. Third is the problem that we are going to face no matter what we do; with the continually changing RCRA deadlines and any impact that those might have on the 1993 compact deadlines.

We believe that it is possible that some statutory fixes may be helpful to some of those latter items. In terms of the mixed waste issue, we are in the process of talking to NRC about two possible options. One is an option that literally would have us divide the pie of waste, and decide which types of waste were more of concern for their radioactive nature, and which ones are more of concern for their hazardous waste nature. The second version of that would be some kind of a statutory delegation from one agency to the other agency for some or all mixed waste.

In either of these cases, it is important for us to come to grips with the question of whether all of the RCRA provisions that were put into the 1984 amendments, including corrective action and location standards, are in fact appropriate for the mixed waste class.

The second area that we believe a statutory fix might be useful would be in the area of norm waste, to either cover it by the Atomic Energy Act, or to allow special standards under RCRA.

In conclusion, let me just say that we intend to continue to work with our other Federal agencies to keep this moving forward. We will keep you advised on additional discussions that we are having with NRC with regard to a more specific fix in light of the Brookhaven report. While we were not able to provide answers in our written testimony to all of the questions that you did raise with us in your March 19 letter, we will have those submitted in writing.

Thank you.

Senator SIMPSON. Thank you. They are very important questions and deserve a thoughtful response.

Mr. John G. Davis, please.

STATEMENT OF JOHN G. DAVIS, DIRECTOR, OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS, NUCLEAR REGULATORY COMMISSION, ACCOMPANIED BY ROBERT E. BROWNING, DIRECTOR, DIVISION OF WASTE MANAGEMENT

Mr. DAVIS. I am John Davis, the Director of NRC's Office of Nuclear Material Safety and Safeguards. I would like to give a shortened version of my prepared statement, and have the full statement submitted for the record.

Senator SIMPSON. Without objection.

Mr. DAVIS. I am accompanied today by Mr. Robert E. Browning, the Director of NRC's Division of Waste Management.

I am here today to discuss a topic that was not resolved by the Low Level Radioactive Waste Policy Amendments Act of 1985, and that topic is the disposal of low-level radioactive mixed wastes.

My comments represent NRC staff's technical views. The NRC and EPA staff continue to work together to identify, understand and resolve the issues of concern. The NRC staff has not yet presented policy options to the Commission. Therefore, the Commission has not had an opportunity to fully address the policy implications of this issue.

The NRC has sponsored several studies, coordinated with the EPA technical staff, in an effort to better understand the nature and magnitude of low-level mixed waste currently being generated.

One study indicates that at present scintillation media and other low-level wastes containing organic solvents comprise the largest category of mixed wastes. Lead used for shielding scintillation waste from biomedical sources, organic solvents for cleaning operations, chromium-containing wastes from reactors, and miscellaneous wastes that may be unique to a specific generator were also identified as potential mixed wastes.

The study suggests that currently generated mixed waste represents a small volume when compared to all wastes. Mixed wastes were estimated to be less than 3 percent of all radioactive wastes shipped for disposal in 1984.

A second study reports on current practices and management options available to handle the mixed wastes. Existing management options can be used to reduce volumes of the mixed waste requiring disposal to levels below those documented in the survey.

NRC staff, however, cannot overlook the possibility that the quantity of mixed wastes requiring disposal may increase in the future. An increase could occur through a future decision by EPA to add additional substances to its list of hazardous materials, or the consequence of decontamination and decommissioning operations at nuclear facilities.

The NRC staff also initiated independent sampling of ground water monitoring wells at two representative low-level waste disposal sites in humid climates. Several hazardous organic constituents were detected that had migrated from the low-level waste trenches.

The NRC staff has assessed these releases and has determined that the releases will not result in any exposure to the public.

The plan to respond to the information collected in the staff analysis includes modification of the monitoring programs at cur-

rent operating sites. The staff believes that future health impacts at the six existing sites are unlikely.

In parallel with NRC's studies on mixed wastes, NRC and EPA staffs have been meeting to determine the best way to continue to assure the protection of the public health and safety and the environment, while at the same time seeking to eliminate unnecessary dual and conflicting regulations of low-level radioactive mixed waste disposal.

During the hearings related to the passage of the Low-Level Waste Amendments Act, both the NRC staff and EPA testified that acceptable to both agencies, as a resolution of the dual jurisdiction issue, was the delegation of RCRA authority to the NRC for mixed wastes.

Legislation was deemed necessary because existing RCRA statutes only allow EPA to delegate its RCRA authority to States, but not to other Federal agencies. However, NRC's position at that time was based on incomplete understanding of the full impact and of the status of EPA's implementation of the RC Amendments Act of 1984.

NRC staff understands that not all legislatively mandated RCRA implementing regulations are in place at this time. For example, siting and design criteria for RCRA facilities have yet to be determined.

Further, staff believes that issuance of these implementing regulations will not occur within the timeframes established by the Congress for the States to site and develop low-level waste facilities.

NRC is concerned that uncertainties resulting from the evolving nature of the RCRA regulations could threaten the timely implementation of the milestones in the Low-Level Waste Amendments Act.

If States are required to design their low-level waste facilities to meet RCRA for the disposal of mixed wastes, the uncertainties surrounding the RCRA requirements could delay the congressionally mandated development of new licensed low-level waste disposal capacity.

These are some of the points dealing with the impact of RCRA on the implementation of the Low-Level Waste Amendments Act that are now apparent to us. NRC staff has discussed these points with the EPA staff, and they are in agreement with our analysis of these potential implications. Since these discussions are of a continuing nature, not all potential concerns or issues are being addressed at this time.

The mixed waste regulatory uncertainty has led NRC staff to conclude that delegation of RCRA authority to the NRC in and of itself may not provide a complete solution to the mixed waste issue. Thus, NRC staff no longer supports the earlier proposed legislative approaches, while seeking to reach a technical solution in coordination with EPA.

Using the information provided by the recently completed study, and in coordination with EPA staff, NRC staff is in the process of considering options available for regulating the disposal of these mixed wastes. This consideration has not yet been completed.

The NRC staff's goal is to assure that the actions required under the Low-Level Waste Amendments Act can proceed, while a legislative solution is developed for mixed wastes. We suggest that whatever specific action the Congress does choose to take should minimize the generation of mixed, remove any regulatory uncertainty where it stands to impede the timely implementation of the Low-Level Waste Amendments Act, and resolve questions of multiple and/or conflicting jurisdiction.

We also received a series of questions with the announcement for this hearing and thus far have been unable to provide those at this time. We will submit them for the record.

Thank you.

Senator SIMPSON. Thank you all very much, indeed. I appreciate your testimony.

Let me share with you that in my time here, and chairing the Subcommittee on Nuclear Regulation, since we first became involved in the mixed waste issue, a number of years ago, it seems to me that there has been a remarkable degree of confusion over exactly what is and what is not mixed waste.

It is often used as an extraordinary bandying it about. Mixed waste is this. No, it is not. Yes, it is. We have gone through that, at least I have observed that process. Now we have this Brookhaven National Lab study recently completed. From the work done there, do we now have a fairly good sense of the volumes and sources and types of mixed wastes generated by NRC licensees that these various Federal agencies that you represent agree on?

Mr. DAVIS. From the NRC perspective, Senator Simpson, I would not say that we have exhaustive knowledge. It does not examine each and every mixed waste stream. However, in developing the information which we have, we did use a questionnaire approach, or our contractor did, and for 1984, of all the volumes of mixed wastes which were disposed, we believe it covers about 25 percent of total low-level waste volume disposed in 1984. It is a large sample, but it is not exhaustive. There might still be mixed waste streams that we have not yet identified.

Ms. WILLIAMS. We would support those comments. We think that it is a good starting point in laying out what is out there, and we think that it will be pretty helpful on moving forward. Of course, that is just the NRC facilities, and it still leaves open the question of the mixed wastes at DOE facilities.

Senator SIMPSON. Are EPA and NRC able to agree with the Brookhaven conclusion that approximately 3 percent of the total low-level waste is mixed waste, and that it comes primarily from three sources designated in that conclusion, the three sources being the organic liquids associated with scintillation vials, lead shielding, and chromates from ion-exchange rosins used in power reactors. Could you agree on that?

Mr. DAVIS. Basically, we agree. If you look at the ground water monitoring program, which is done at sites, we have seen some other organic constituents, other than the scintillation solutions. At some time in the past, there may have been other organic constituents in wastes placed in these low-level waste-sites.

Senator SIMPSON. So it is not just those primary three sources, it is others.

Mr. DAVIS. I would not disagree as far as we know now with the word "primary," but I would not like you to believe that it is exhaustive. There are perhaps others out there.

Senator SIMPSON. Ms. Williams.

Ms. WILLIAMS. Yes, I would support that. In fact, in terms of the volume, we were doing some relooking and reevaluating of figures, and it looks to us like that would convert to about 1,500 tons of mixed wastes if you convert that 3 percent figure.

Senator SIMPSON. Aside from disposal of this waste in a low-level waste disposal facility, are there other options such as incineration, or decontamination that might minimize or eliminate the need to dispose of these mixed wastes in disposal facilities that should be pursued or encouraged?

Mr. DAVIS. We believe that there are options which can reduce the volume of these wastes, Mr. Chairman. However, we have not yet come up with an option or a management technique that would eliminate mixed wastes, although we do believe that by focusing of the industry on the problem, for one thing, second, by proper segregation management of the wastes plus incineration and other management options, there can be a reduction from that which now exists.

Ms. WILLIAMS. Incineration seems like it might be a viable alternative for a number of types of mixed wastes, perhaps not all, solvent, paper, wood, plastics, some of the clothing. At this point in time, we are only aware of one DOE PCB mixed waste facility that is operational. We are not aware of any commercial operating facilities.

These facilities, of course, would require EPA RCRA permits in order to operate.

One of the other areas would be decontamination approaches which we believe might be useful, but they are very expensive right now, and unless you are trying to decontaminate reuseable things, it would probably not be too feasible.

Again, we would like to see stressed the waste minimization aspect of what we are dealing with here.

Senator SIMPSON. Let me ask you, as a representative of EPA, is incineration appropriate for scintillation vials in your view?

Ms. WILLIAMS. It seems like it should be. Again, if incineration can get the necessary reduction, which in the case of a lot of the solvents, it should be able to, it seems like it would be an appropriate alternative if the facility was properly constructed and operating.

Senator SIMPSON. Let me ask you, Mr. Barker. I note in your testimony that at this time the administration does not have a current position on Senator Glenn's bill. That is your testimony. At the end of your statement, you indicate that in your view new legislation is not necessary.

If new legislation is not necessary, does that not indicate that you are opposed to enactment of S. 892?

Mr. BARKER. That portion of the written statement is not as well worded as it should have been. The idea there is to emphasize the need to maintain the situation with the relative expertise of the different agencies being brought to bear on the different kinds of

wastes. In our case, the Department of Energy expertise is in the radioactive area.

Senator SIMPSON. Is the Department opposed to the enactment of S. 892?

Mr. BARKER. Again, we have not developed that position at all. It is still being reviewed.

Senator SIMPSON. You are too young to get caught in all of that obfuscation. Just give me an answer.

Mr. BARKER. Our position is that the current legislative framework is adequate to address the needs of mixed wastes. The position that we have been developing and reviewing within DOE is one that would state that the bill is unnecessary.

Again, the administration has not developed a position yet, so the Department is not taking a position.

Senator SIMPSON. I admire your coming here to testify. I do believe that this issue really requires the high-level attention of the Department of Energy, and they are not there yet. We are going to see that they do get there. This is no reflection upon you at all. I appreciate your coming here. But I really believe that this one escapes their attention as to how we think of the seriousness of this issue. I am going to be visiting with DOE officials on it.

Mr. BARKER. Quite frankly, I can attest that it has gotten the attention of the highest officials at the Department of Energy, and they have been intimately involved in the preparation of our presentation here, and on the entire issue of mixed wastes. I can personally attest to that, with no reservation whatsoever.

Senator SIMPSON. We will pursue that.

Let me ask you, Mr. Barker, if you would please provide the subcommittee with a comprehensive list of the mixed wastes generated at DOE facilities, and include in that analysis for us, please, your comments on Senator Glenn's table that he entered into the record with regard to Hanford. Would you please do that for the record?

Mr. BARKER. Yes, we will do that, sir.

[The information requested follows:]

INSERT FOR THE RECORD

A copy of the Department's Waste Stream Report for Byproduct Material, Hazardous Waste, Candidate Radioactive Mixed Waste, Transuranic Waste, and Radioactive Nonhazardous Waste has been provided directly to Chairman Simpson and one has been provided to Chairman Chafee. This report contains a comprehensive list of the waste generated at the Department's facilities. Attached is a table containing several corrections to the information on the table provided by Senator Glenn.

HANFORD

Type of Waste	Amount	Disposal Practices: Past	Current	Future
High-level		1944-1970	1970-today	1990's
Liquids 1/				
Fluid	78,200 cubic meters	149 single shell tanks. 2/3/	double shell tanks: 2/	Vitrification after removing cesium thereby producing high-level and low-level waste. 4/ Low-level will be cemented and buried.
Sludge	48,400 cubic meters		20 active	
Slurry	4,300 cubic meters		8 CY 1986	
Salt Cake	95,600 cubic meters		4 budgeted for FY 1987	
Capsules: 5/				
Cesium	893			
Strontium	607			
Solids	None			
Transuranic		1944-1970	70-today 2/	1988 on
Stored (CH&RH)	13,716 cubic meters	Disposed with low-level waste in shallow pits.	Retrievably stored pending geologic repository	Process, package, and send to WIPP.
Buried	91,660 cubic meters			
Soil	68,700 cubic meters			
Low-level		1944 - - - - - - - - - - - - - - - - - - -today		Date Unknown
Liquids	195 billion gallons	Disposed in cribs, ponds, trenches, ditches and french drains--there are 28 active and 276 inactive. (one active added and one inactive deleted since Hanford talked to GAO in January.)		(Grouting is not being considered for all large volume waste streams.) Depends on the study to comply with DOE Order 5820.2.
Solids	8.4 million cubic feet	Some fraction of the previously disposed waste may be mixed (hazardous plus radioactive) waste. These sites have been included in the Phase I CERCLA review. Buried in shallow pits or trenches. There are 62 inactive and 11 active burial sites.		Pre 1970 burials addressed in Defense Waste EIS. Post 1970 solid LLW accepted as disposed.

Hazardous Only			1985 - - - - - - - - - - - - -
Liquids	3,997 gallons as of January 1986.	Until 1985 - some disposed in solar evaporation basins (4).	Off-site disposal
Solids	1,713 cubic meters	Landfill	Landfill
(Note: DOE states that this category is small. DOE's statement is borne out in several documents.)			
Mixed Waste		1944 - - - - - - - - - - - - - - - - - today	
Solids	1985 total: 14,733 cubic feet. (see comment under solid low-level waste previous page.) Includes: lead sheeting, perchlorethylyene, acid, sludge, mercury, and organic solids.	Disposed in low-level burial grounds in 200 E and 200 W areas--6 active sites.	Future unknown. Application of RCRA could affect long-term disposal practices.
Liquids	Included with low-level	27 active	

1/ 200,000 cubic meters (note: The liquid volumes are not necessarily additive and the actual total volume is about 200,000 cubic meters instead of 300,000 cubic meters).
2/ Currently in storage, not "disposed".
3/ An EIS has been prepared for the disposal of the contents of the 149 tanks.
4/ Relates only to material stored in double shelled tanks.
5/ Current (4/1/86) inventory of capsules actually stored at Hanford. More capsules have been made, but many are shipped offsite for use in other programs (food irradiation, Oak Ridge use).

Senator SIMPSON. I appreciate that.

Just a couple more questions. Let me just ask this question, and then go to Senator Stafford.

Mr. Davis, in your testimony you have indicated that based on the information compiled in the Brookhaven report: "NRC staff made a determination that it is not necessary to survey the entire group of licensees that might be generating mixed wastes."

Does that mean, in your view, that the Brookhaven work is a representative sample of what we would expect to find if all generators were surveyed?

Mr. DAVIS. We believe that, as I remarked, Senator Simpson, the Brookhaven work did, for 1984, include a fairly large sample, about 20 to 30 percent of the low-level waste disposed.

We believe it does represent sufficient information for considering the issue, and to lead us to some decisionmaking. Again, there may be some waste streams with other hazardous components which were not picked up in this study.

Senator SIMPSON. Senator Stafford, do you have any questions, sir?

Senator STAFFORD. I do, one or two, Mr. Chairman. Thank you.

I regret that I wasn't able to hear some of the testimony from the Government witnesses. The reason is, speaking on a nonpartisan basis, there is a hotline out on one side of the Capitol that there will be a briefing at 2 o'clock for Senators on Nicaragua and Libya. The other side of the Capitol is trying to run that down to see if it is true, because if it is, it will mean that we will have to postpone a meeting of conferees on Superfund from 2 until a later hour in the afternoon.

Might I ask the representatives of both the NRC and EPA, in your opinion, are mixed wastes now being disposed of or managed safely?

Who wishes to respond to that?

Mr. DAVIS. Senator Stafford, NRC primary regulation of mixed wastes has been founded on the radiological aspects of the wastes, the source special nuclear and byproduct material constituents within mixed wastes. We believe that in regulating the radiologic constituents, we do have a degree of protection afforded to any hazardous material, chemical hazardous material, which may be bound to the radioactive material.

My basic conclusion is that at the current time, those quantities going into radioactive low-level wastesites do provide adequate protection.

Senator STAFFORD. Thank you.

Ms. Williams.

Ms. WILLIAMS. I guess that it is hard to give the exact answer to it, but let me give you a couple of observations. One is that I think, in general, we are dealing with relatively small quantities, and quantities that are decreasing. It appears that they are decreasing over time.

Second, the ground water monitoring that has been mentioned does indicate that if you look at the kinds of wastes that are going into those facilities right now, we are not seeing those picked up in ground water monitoring, which would indicate, at least, that they are not getting into the environment and causing problems.

While this is not an explicit answer, the observations are that there don't appear to be major problems right now.

Senator STAFFORD. For both of the witnesses who have just responded, this question.

If mixed wastes have been and are being disposed of, or managed safely, is there a need for administrative or legislative action aimed at reconciling the EPA and NRC regulations governing the land disposal of mixed wastes?

Mr. DAVIS. The NRC staff view is that we need to remove the uncertainties associated with dual regulation. Our particular concern at this time is that these uncertainties may impact on the schedules which the Congress established under the Low-Level Waste Amendments Act.

Ms. WILLIAMS. We would certainly support the fact that we don't think that dual permitting/enforcement is particularly efficient or desirable. We don't think that any advantage comes out of a dual permitting situation, so we would like to see that resolved.

Senator STAFFORD. Finally, may I address this question again to you, Ms. Williams, and this one to you, Mr. Barker.

As I understand it, most all byproduct material as defined in DOE's proposed rule would contain some hazardous material. However, RCRA would not apply to these materials because it would be considered part of the byproduct material.

The question I have is, Why shouldn't RCRA apply to these hazardous components in the same manner as it applies to the hazardous components of other DOE waste streams?

Mr. BARKER. The byproduct waste streams that we are referring to contain basically three kinds of materials. One kind is high level. The second kind is transuranic, or truwaste. The other is low level.

The high level and transuranic wastes have very high radioactivity; the hazardous component is relatively minor. Moreover, the treatment that these materials will get under the AEA requirements will more than meet the concerns that would be associated with that hazardous component.

Senator STAFFORD. Thank you.

Ms. Williams.

Ms. WILLIAMS. Again, I think our feeling is that if it really is mixed with hazardous waste, and this may be more of a concern on the issue of the lower level than the higher level, it should probably be regulated to conform with RCRA requirements.

Senator STAFFORD. Does anyone else want to comment?

Mr. BARKER. If I could add, in the low-level area, aside from the high level and transuranic, Ms. Williams was referring to the idea that they should be regulating. DOE orders do address this, and we are revising and reviewing those orders to ensure that those low-level wastes do receive a treatment that is sufficient to address the concerns associated with that hazardous component as well.

Senator STAFFORD. Thank you both.

Mr. Chairman, I do have a few other questions, which for the sake of time, I would ask unanimous consent that I be allowed to submit in writing.

Senator SIMPSON. Without objection.

Thank you, Mr. Chairman.

Now we have another, Mr. Chairman, with us down there at that end of the panel, our chairman of the Energy Research and Development Subcommittee of the Senate Energy Committee, and a member of the Subcommittee on Nuclear Regulation, and the chairman of the Budget Committee. What are you doing over here?

Senator DOMENICI. I am hiding. I am getting ready for Easter.

Actually, Mr. Chairman, I just came to see if I might get a tiny glimpse of what is going on, and I haven't been here long enough to find out.

Senator SIMPSON. You could have been there all day, and you still wouldn't know.

Senator DOMENICI. You and I planned that one for this morning. That is what I said I would say, and that is what you said you would say.

Senator SIMPSON. No; we didn't, but it seemed to fit.

Senator STAFFORD. Welcome to the club.

Senator DOMENICI. In fact, I asked my staff to give me a quick summary of the issue, and was given a 14-page memorandum. That is too much for me these days.

I just want to say to you, as chairman of the subcommittee, and, of course, Senator Stafford, as chairman of the full committee, I think that it is absolutely imperative that we solve this problem. I don't think that we can leave it out there as we have a lot of other issues, and let the various agencies thrash their way through it. It is too important.

I also wish that Mary Walker was here. She had to send somebody in her stead. We are glad to have you here.

I have had a chance to talk to the Secretary of Energy, who is in charge of the DOE part of this problem as it pertains to the Energy facilities and the military facilities, and I am fully aware that he is committed to an expeditious handling of the cleanup that they have to do, and he has requested substantial new money to get on with the job.

In fact, when he tendered Mary Walker as his assistant in this area, clearly she made the case up here that they were going to get on with doing their job, and they are going to need new resources. I have helped in appropriations last year to get them a first step in that new resource requirement.

I just want to urge that Mr. Barker take back the information that at least this Senator says that she had better get on with it. It is a very slippery slope, and if we don't get started down it, in terms of DOE doing their part, somebody else is going to do it for you. I have found that every time this happens around here, it takes about 6 years to iron out who is doing what to who and which regulations apply.

I just urge that you get on with telling us precisely what you need to help to get the job done. I, for one, will help as much as I can in seeing that you have the resources.

Thank you very much, Mr. Chairman.

Senator SIMPSON. Pete, you weren't here when I made some similar comments about the degree of attention to this issue by the DOE. I thought that they ought to sharpen that a bit. You certainly add another voice to that.

I just have a couple more questions, and then we will go to the next panel.

For Mr. Davis, because we have a serious issue coming up with the low-level waste, you noted in your testimony that there is a real potential for EPA's RCRA regulations, which are currently under development, to delay the process of selecting low-level wastesites, if those sites are to accept mixed wastes for disposal.

At what point would EPA's RCRA regulations have to be in place to avoid the delay that you have identified?

Mr. DAVIS. Senator Simpson, hopefully as early as possible. As you know, when the two agencies testified on the low-level waste amendments, we thought we were aiming toward a solution to this by RCRA being delegated to the NRC for these low-level wastesites.

It is only recently, in our further discussions with EPA, that we became aware of the uncertainty in the RCRA requirements that could be placed on low-level waste.

If you are asking for a specific date, Senator Simpson, I would have to submit that.

Senator SIMPSON. If you would, please.

Mr. DAVIS. We would be happy to, sir.

Senator SIMPSON. Now, one final question of the EPA. In the absence of any legislative clarification here, would you be required to apply RCRA to the disposal of mixed wastes in an NRC-licensed low-level radioactive waste disposal facility?

Ms. WILLIAMS. Yes.

Senator SIMPSON. If so, what specific regulatory requirements would apply? Are those regulatory requirements in place today and, if not, when would they be in place?

Ms. WILLIAMS. Many of them are in place today, and many of them are requirements that we put—most of them will be in place over the next 2 to 3 years, but there are some that will not be in place until the 1990 timeframe based on the timeframes that were set up for us in the 1984 amendments to RCRA.

There are really two types of changes that I think are of concern to NRC. One is actually the new requirements. The other is the fact that new wastes may be identified as hazardous wastes, and that can happen at any time as we get additional data to support that finding, and it would mean new types of wastes would be brought into the hazardous waste regulatory framework.

Senator SIMPSON. Can you tell me when the siting requirements would be in place, if they are not there already?

Ms. WILLIAMS. Location standards are the first phase, and they are in place now, and some additional guidance will be going out with regard to siting criteria within the next 3 months or so. But the actual requirement to do location standards is not until 1988.

Senator SIMPSON. Thank you very much.

Thank you, Mr. Barker, particularly Ms. Williams, and John Davis. We appreciate your testimony.

The second panel please come forward: Jerry J. Scoville, president of U.S. Ecology; Dr. Richard C. Reba, director of the division of nuclear medicine of George Washington University Medical Center testifying on behalf of the American College of Nuclear Physicians and the Society of Nuclear Medicine; David Berick, director of the nuclear waste and safety project of the Environmental

Policy Institute; Sherman Naymark, the chairman of Quadrex Corp.; and Leonard Slosky, adviser to the Governor of Colorado, Dick Lamb.

Mr. Scoville, please proceed, and we have the limitation of 5 minutes. I thank you very much.

STATEMENT OF JERRY J. SCOVILLE, PRESIDENT, U.S. ECOLOGY

Mr. SCOVILLE. Mr. Chairman, thank you very much. I appreciate the opportunity to be here.

Senator SIMPSON. Could we have order please, so that we can extend courtesy to these witnesses. If you wish to converse, please go to the hallway.

Mr. SCOVILLE. Thank you, Mr. Chairman.

U.S. Ecology, whether it likes it or not, has been identified with the mixed waste question for quite a number of years now. I recall attending a hearing of your subcommittee in Cheyenne, WY, in the winter months several years ago when we first raised the question of mixed wastes.

I think, since that time, while we may not have made progress in solving the problem, we have at least made progress in identifying it as a major issue that needs some attention.

I am the president of U.S. Ecology, a company that operates two of the Nation's three commercial low-level radioactive waste disposal sites, one near Beatty, NV, some 100 miles northwest of Las Vegas, and the other on the Department of Energy's Hanford Reservation in the State of Washington.

Our company has over 25 years of experience in managing low-level radioactive waste and has been closely involved in the regulatory processes governing this type of material.

We have been asked specifically to comment today on the dual regulation of low-level radioactive waste disposal facilities by both the NRC and the EPA, otherwise known as the mixed waste issue.

It is our view that the dual regulation of low-level radioactive waste disposal facilities by the NRC and the EPA threatens the regional compact system for it presents potentially unresolvable difficulties for present and future site operators, the medical profession, and industrial land utility operators as well. In my testimony last year, I raised these same concerns, and they are equally valid today, and perhaps more pressing as we attempt to move on to siting new facilities.

Because of the extensive nature of the questions posed by the committee, which were not received by me until last Friday, and my short time allotment, I will only briefly address each of the eight areas requested. However, the company will provide fully responsive answers within the next 2 weeks for incorporation in the record.

The first question that was referred to us was to comment on the Brookhaven report. We believe, by its own admission, it is a less than accurate portrayal of the total mixed waste issue. The analysis relied upon surveys of classes of generators and a disproportionately small number of medical institutions responded to the survey. It was also stated in the analysis that many of those responding to

the survey were probably uninformed and unfamiliar with RCRA regulations to which they were responding.

At the heart of this problem is the issue of what is a mixed waste. Without a definite answer to this root question, the Brookhaven report and any projection I could make with respect to the amount of mixed waste is just conjecture. My fear is that without a Federal definition in the near future, such conjecture will also be made by each and every State regulatory agency, and that will lead to unequal enforcement, and very big difficulties in trying to site new facilities.

The second question had to do with the percentage of mixed waste produced in this country as compared to the total amount of low-level rad waste produced, and that is a function of the definition of mixed waste. The Brookhaven report estimates that the total is less than 3 percent for medical wastes, up to 20 percent, if you include lead shielding and other factors, for reactor wastes.

If you use another indicator, basing it on the receipt of wastes at the sites which we operate, and the number of wastes that have been identified by their generators as hazardous or mixed wastes under RCRA, the answer would be zero. This is because we have never received any waste shipment at a low-level wastesite that was manifested as RCRA regulated as required by law.

Further, one wonders if certain specific waste streams are identified as RCRA-controlled wastes, then do they come from generators who are exempt under the small generator exemption in RCRA and, therefore, would not be classified as a mixed waste.

These are fundamental questions that need to be answered. If generators have been shipping such wastes to our facilities, then they have been in violation of standards set forth under RCRA. In this case, we may have a number of criminal institutions, such as the Mayo Clinic, and other major hospitals around the country.

So I am pleading for a very careful definition of mixed wastes to eliminate these absurd kinds of inconsistencies and considerations.

Of the wastes listed in the Brookhaven report, U.S. Ecology has ceased the receipt of all scintillation liquids and vials containing organic chemicals. We have no company prohibition from receiving the rest of the low-level radioactive waste types. When somebody tells us that they are RCRA hazardous and we shouldn't be doing it, then we will certainly cease.

It was our understanding that these wastes which we ceased receiving were potentially RCRA wastes and we were so informed by the State and Federal regulators. The other materials, as I said, have not been identified as such.

I think that we should keep a realistic perspective of this problem and, perhaps, another example is a way to do that. Very large volumes of hazardous chemical wastes that would be required under RCRA to be controlled and handled are being disposed of in sanitary landfills as a result of small generator exemptions, much larger volumes than we are dealing with here. That is not to say that we shouldn't solve this problem, but it is just to keep the perspective.

It is my understanding that most of the materials that we stopped receiving are being sent to a facility in Florida where the vials are crushed and the scintillation fluid is then used as a fuel

in a cement kiln. The operator performing this work has a radioactive materials license but does not have a RCRA permit for the treatment of these materials, another inconsistency that has to be solved by legislation.

My company has a firm commitment to build a low-level waste incinerator at a facility in North Carolina. We have been in the licensing process for 2 years, and we have been unsuccessful, in part, to this point because of the uncertainties surrounding mixed wastes.

Senator SIMPSON. Mr. Scoville, I don't mean to be rude, but I have another appoint at noon that I must attend. If you could summarize very swiftly, all of that will be received in the record. I apologize, but I simply have no other choice.

Mr. SCOVILLE. I surely understand, and I will submit this for the record.

Let me just give you some recommendations quickly that U.S. Ecology has, and I will conclude there.

Senator SIMPSON. I will give you 30 seconds.

Mr. SCOVILLE. We think that the NRC should be vested with the authority to regulate all radioactive wastes including naturally occurring and accelerator-produced wastes, and avoid some of these definitional problems.

The NRC be vested with permitting authority to regulate mixed wastes, those low-level radioactive wastes that contain a miture of radioactive and hazardous waste. We also recommend that provision be made for the EPA to review the NRC mixed waste program for compliance with EPA's responsibility under RCRA; and that a national scheme for the regulation of mixed wastes be developed so as to provide uniformity among the several States.

Thank you.

Senator SIMPSON. Thank you very much, and I appreciate your sensitivity to the problem.

Dr. Reba.

STATEMENT OF DR. RICHARD C. REBA, DIRECTOR, DIVISION OF NUCLEAR MEDICINE, GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER, ON BEHALF OF THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS AND THE SOCIETY OF NUCLEAR MEDICINE

Dr. REBA. Thank you, Mr. Chairman.

I am Richard Reba. I am a professor and director of nuclear medicine at George Washington University Medical Center, and I am speaking on behalf of the American College of Nuclear Physicians and the Society of Nuclear Medicine. With me is Capt. William Briner, retired, who is director of the Nuclear Medicine Laboratory at Duke University Medical Center, who is our chairman of our government relations committee for the society, and who, incidentally, is a commissioner and secretary treasurer of the Southeast Low-Level Waste Compact.

You have our complete statement, so with your permission, I will summarize to expedite our testimony.

Senator SIMPSON. Thank you very much.

Dr. REBA. I would like to draw attention to the December 1985 report of the Conference of Radiation Control Program Directors, published under contract to DOE, which noted that academic and medical institutions generated approximately 100,000 cubic feet of low-level radioactive waste in 1984, which is about 4 percent of the total produced in the country.

A survey, the same year, by the Brookhaven National Laboratory for NRC indicates that approximately 34 percent of that 4 percent is organic liquids regulated under the RCRA. These organic liquid wastes are products of clinical diagnostic testing and nuclear medicine laboratories, and from research directed in part to the development of new prescription drugs.

In November 1985, most of the medical waste was buried at the Richland disposal facility, but on November 8, you know, the Richland management felt that they could no longer comply with EPA regulations, they filed a closure notice and stopped accepting liquid and other hazardous chemical wastes. These wastes are now being burned, at least the vast majority of them, at one commercial facility in Florida.

To summarize the present situation and to make a few specific recommendations:

One, the research and medical communities are now totally dependent on one disposal facility for handling the majority of low-level liquid mixed wastes generated by our clinical diagnostic testing and by research important to continued medical advances. Therefore, we are in a vulnerable position, Senator, and we don't believe that this is a prudent situation for the country.

We believe that incineration is probably the best technique for disposal, but unfortunately, because there are no EPA guidelines, that is, there is no table 2 in title 40 defining what are the limits to what can be incinerated, and no commercial low-level waste incineration facility is operational, this technique is not available.

Let me go back for a moment and mention, for the record, because you are already aware, that every State, or group of States acting as a region, must develop a site plan by January 1988 for disposing low-level wastes, and by January 1990 have filed a completed application. States that miss these dates are exposed to escalating penalties and possible loss of access.

Because the requirements for low-level, liquid, mixed waste disposal issued by NRC and EPA are in conflict, and because there is great uncertainty over what the future regulations might be, critical decisions that States and regions must make are being delayed. That is, planning agencies that are attempting to develop new sites in their regions, plus the operators of the Richland site, for example, who want to modify their operations so that they can be in compliance for handling organic liquid wastes, are not taking action because they don't know what to do to comply with both EPA and NRC regulations.

Furthermore, the commissions making the siting decisions and developing the engineering plans must know whether or not their facilities should provide for the disposal of liquid wastes subject to RCRA. Unless guidelines are developed to which a planning commission can respond, these sites may never be able to accept mixed wastes.

The Brookhaven study outlines the differences between the EPA and the NRC regulations which apply to mixed wastes. It doesn't appear to us that these differences cannot be reconciled. What is needed is that one agency be designated the lead agency, and since these radioactive wastes are being disposed of at sites which the NRC has had responsibility, we believe the NRC should be the lead agency.

We believe that regulations developed by the NRC, in consultation with EPA, can provide a level of protection of public health and environment comparable to the level of protection afforded by subtitle (c) of RCRA. In this regard, we endorse the position recently adopted by the National Governors Association.

Finally, we believe that it is important that the mandate of Congress to the lead agency include the charge that this regulatory impass be resolved quickly. The procedures cannot be cumbersome. They should not include a number of sequential steps which will consume precious time. They should be achievable within 12 months, or otherwise the time lost in siting decisions will result in chaos.

I want to close by complimenting you, your committee, and the Senate, and express our appreciation to this committee and your staff for the statesman-like action in developing last year's low-level waste amendments, and in continuing to consider this bothersome mixed waste problem.

We are at your disposal, and please call on us any time that we can be of assistance.

Thank you.

Senator SIMPSON. Thank you very much, doctor. Indeed, it was a pleasure to be involved in the low-level waste legislation, and it was a fine bipartisan approach with some marvelous staff work in this committee, and in the Committee on Energy and Natural Resources.

David Berick, please. Nice to see you again.

STATEMENT OF DAVID BERICK, DIRECTOR, NUCLEAR WASTE AND SAFETY PROJECT, ENVIRONMENTAL POLICY INSTITUTE

Mr. BERICK. Thank you, Mr. Chairman.

I am testifying today on behalf of my own organization, the Environmental Policy Institute, as well as the Sierra Club, and the Natural Resources Defense Council.

I want to thank you, Senator Chafee, and Senator Stafford for the opportunity to testify today. I promise you that as soon as I get back to the office, I am going to chew out my staff for not getting all of those answers to all of your questions in by this morning. They are really never going to hear the end of this.

Senator SIMPSON. Good.

Mr. BERICK. Their bonuses are going to be gone.

Senator SIMPSON. If their bonuses are gone, David, are you going to blame it on Gramm-Rudman-Hollings?

Mr. BERICK. No, I won't, Senator.

Senator SIMPSON. Everybody else is.

Mr. BERICK. Senator, our basic message this morning is that there is nothing wrong with the law. As Senator Glenn noted this

morning, section 1006 of RCRA applies an inconsistency test to the application of RCRA to Atomic Energy Act facilities. We have been operating here with sort of an underlying assumption that somehow RCRA preempts the Atomic Energy Act, I think, in a certain way. There is sort of a prevailing sentiment that somehow the agencies can't work this thing out, RCRA stands in the way.

It is important here to emphasize that RCRA does contain an escape valve. RCRA in and of itself, the law, does not preempt, does not require inconsistent application. It requires just the opposite. It requires consistency, and if there is inconsistency, then EPA, or whoever is implementing RCRA, cannot apply those requirements inconsistently.

All the same, I think that it is important, and I think the record today shows, especially with regard to DOE facilities, that RCRA hasn't been applied. I think that if there is a message that comes home to us, it is that part of the problem today is the fact that we haven't been applying RCRA. I think that it is certainly true with the DOE facilities.

As Mr. Scoville pointed out just a little bit ago, it may well be true in the commercial waste as well. Part of our real uncertainty, and I think everyone else's uncertainty about mixed wastes, stems in part from the fact that RCRA hasn't been fully implemented in that it places the burden on the generators, in large part, for determining whether or not wastes are mixed wastes.

It is not up to NRC to have Brookhaven National Laboratory give us this data years after RCRA regulations go into play. So I think that one of the important messages that we want to get across this morning is that it is not clear to us that there are problems in the law. There are certainly problems in the way the law is being implemented.

Barring some real changes at the Department of Energy, including, we believe, a rescission of this byproduct rule that they have proposed, which would exempt large categories of materials from RCRA, regardless of their nonradiological constituents, but based on legal interpretation, we think that there would be no choice but for Congress to go ahead with Senator Glenn's legislation and reassert, as we believe the current law requires, that RCRA apply to mixed wastes at DOE facilities.

On the question of commercial waste, I think the real underlying question for us is not whether or not you carve up the jurisdiction in favor of EPA, or you put it in favor of NRC. In our view, neither set of regulations really is adequate to address mixed wastes. Neither set was developed with the mixed wastes' dual problem, not dual regulation, but dual problem, having two particular kinds of hazards.

In our testimony, we point out some problems with the NRC regulations.

It is clear to us that EPA has to go ahead and develop specific regulations for mixed waste in order to handle these DOE facilities. Even if the byproduct rule was to be fully implemented, as DOE proposes, EPA would still have to go out, in our view, and develop specific regulations to handle those sites.

We don't see that the need to develop additional regulations is in any way avoided by shuffling the jurisdictional deck of cards. What

we do believe is necessary is for both of the agencies, NRC and EPA, to attempt to develop specific regulations for mixed wastes. We believe that the basis for that ought to begin with an effort to segregate those mixed wastes. It is the segregation, I think, that gives us the greatest opportunity to treat, through incineration or other methods, the waste, and to attempt to resolve a lot of the nuts and bolts technical issues, and ultimately some of the regulatory issues that pertain to mixed wastes.

There has been a lot of concern about delay in EPA promulgation of RCRA regulations. We share those concerns. But the mixed wastes don't go away, and they still have to go somewhere. I think that it is in telling that the low-level wastesites today, even those that haven't bumped up against the November 8, 1984, RCRA amendments limits like Barnwell, don't accept a large category of mixed wastes.

The current regulatory regime itself is not an incentive. The real issue can only be resolved by particular people, the two agencies, developing specific regulations.

Senator SIMPSON. Thank you very much, Mr. Berick.

Mr. Naymark, please.

STATEMENT OF SHERMAN NAYMARK, CHAIRMAN, QUADREX CORP.

Mr. NAYMARK. Mr. Chairman, I am Sherman Naymark, chairman of the Quadrex Corp., and my verbal testimony is amplified by the written one, which you have.

Quadrex is a publicly held company serving primarily the nuclear energy generating utilities in the United States, but we also perform services for other industries. For example, our process for liquid scintillation vials removes, to release limits, radioactivity, and toxicity from the vials.

Vials containing radioisotopes are generated primarily by the biomedical research facilities, as Dr. Reba talked about. The waste products are contaminated with carbon-14 and tritium which comprise about 90 percent of the radioisotopes used in this type of research.

These radioisotopes and various others are carried in xylene and toluene solvents which are contained in glass and plastic vials. Radioisotopes are governed by NRC regulations and toxic solvents by EPA. Therefore, burial specs for the vials come under both of these agencies. The eventual disposal of the used vials must meet the requirements of both agencies in burial, decontamination, and storage.

The Hanford facility no longer accepts such vials, and storage is not a total solution. A third method of handling the vials is by decontaminating them, using procedures which are acceptable to the applicable regulatory agencies.

Based on our data, Quadrex currently decontaminates approximately 70 percent of all the vials generated in the United States. We receive the vials from six of the seven major brokers collecting these across the country.

The process that we use mechanically crushes and screens the vials to separate the radioactive material and toxic xylene and tol-

uene from the crushed glass and plastics. After rinsing with a proprietary solvent, the clean, crushed glass or plastic is able to be buried without restriction in a conventional landfill site operating under local regulations. No Federal regulation is necessary for these clean materials.

The contaminated solvent is then burned in an approved rotary kiln facility which is not owned by Quadrex, but which is regulated by the State of Florida under EPA rules. Effluents from the kiln are monitored and are below EPA allowable discharge levels.

We have compiled a summation of all the vials disposed of in the United States on annual basis, and let me put this up here, since Mr. Berick has consented to help me hold the chart up.

This shows from our best estimate the disposition of used vials in the 12-month period from October 1984 to October 1985. The vials are classified in two categories, exempt vials, which do not require EPA/NRC joint regulations because the level of radioactivity is below the standard of concern, and that is over here; 58,000 cubic feet of such materials were handled during this period, with about 75-percent decontaminated by our Gainesville facility, and the other 25 percent handled by storage or burial in permitted landfill, or processed by others.

The regulated, which is here, fall within EPA/NRC regulations for mixed wastes. However, our processing method removes any radioactivity and toxicity before burial of the vial material. For processing ease, we handle both categories by the same process.

During the period in question, we processed 19,000 cubic feet of this material, or about 60 percent of the total generated.

Prior to closure of the Richland burial site, they handled, according to records we have, about 6,500 cubic feet, or 20 percent of the total generated, and storage, or processing by others accounted for the remainder.

We can handle a significantly greater number of vial material annually than the 63,000 cubic feet which we processed during the 12-month period. We believe that we have a complete cost-effective and environmentally sound solution of the mixed waste problem as far as the vials are concerned.

At present, the Gainesville facility is not handling any other mixed wastes. Our Oak Ridge decontamination facility primarily decontaminates metallic low-level radioactive wastes, which are not mixed wastes. Your committee asked if we could handle mixed wastes at Oak Ridge. We do have a proven process for removing suspended radioactive solids from oil, but we do not have an operational process for removing radioactive aqueous suspensions from oils. Thus, if oils are classified as toxic by EPA, we do not presently have an operational process for handling all of the radioactively contaminated oils generated in nuclear plantsites. The mixed waste burial problem has also precluded us from developing a commercial process for removing radioactively contaminated lead bricks used in shielding.

I hope that this responds to the questions that you raised.

Senator SIMPSON. Thank you very much.

Now Mr. Slosky.

STATEMENT OF LEONARD SLOSKY, ADVISER TO THE GOVERNOR OF COLORADO

Mr. SLOSKY. Thank you, Mr. Chairman.

My name is Leonard Slosky, and I am here today representing the State of Colorado. I should also inform you that I serve as director of the Rocky Mountain Compact Board as well.

The State appreciates the opportunity to share its views with you on the issue of mixed wastes. As many witnesses have stated, there do appear to be options available, other than shallow land burial for most mixed wastes. In addition to the Quadrex facility, I am informed that the Scintech Corp. has RCRA permitted its cement kilns in California and Kansas, which use deregulated scintillation fluids as part of their fuel.

There are other technologies, such as distilling scintillation liquids that are under development.

Legally, many of these scintillation wastes can be stored for decay, and then disposed of without regard to their very slight radioactivity. However, many hazardous waste facilities, which would otherwise accept such organic solvents, will not accept these materials because the hazardous waste facility operator considers them radioactive, even though NRC does not.

We share the concerns that have been expressed over the dual regulation of low-level waste as it relates to the siting of new facilities. The regulatory uncertainty involved could be a very major impediment toward the States reaching the goals of the Federal act.

We share the concern also for the regulatory uncertainty relating to NARM, the naturally occurring and accelerator-produced materials. This is particularly acute in our region because the disposal site which we are in the process of siting at this moment will dispose of 97 percent of NARM waste, 97 percent of the wastes received will be NARM, and not NRC-regulated materials.

If we get down the road in siting and designing the facility, and after years of inaction EPA finally issues regulations covering NARM we could find our brandnew facility out of compliance.

The Rocky Mountain board has adopted policy guides for resolving the mixed waste problem. They are that EPA should be required to promulgate performance standards for low-level radioactive waste facilities, which wish to accept mixed wastes, and that these standards be consistent with 10 CFR 61.

We believe that there should be a consolidated permitting process through one agency, preferably the NRC, which applies both NRC and EPA standards. We believe that State authorities over low-level waste facilities should not be preempted.

It is far less than optimal, but one approach that could be explored would be to permit a separate RCRA disposal unit within a traditional low-level waste facility.

I would now like to switch to the issue of mixed wastes at DOE facilities. RCRA is clear, on its face, that all agencies of the Federal Government are subject to the procedural and substantive requirements of Federal and State government. Over the years, a DOE defense facility in Colorado, the Rocky Flats nuclear weapons plant near Denver, has contaminated the air, soil, and drinking water supplies off the plantsite. Colorado has documented ground water

contamination which is believed to be caused, at least in part, by several facilities containing both chemical and radioactive wastes.

DOE has refused to submit a complete part B RCRA application, contending that the State does not have the authority over mixed wastes. The State has issued a notice of intent to deny the incomplete DOE application.

Colorado does not wish a confrontation with DOE, but the State has little choice when a hazardous waste generator fails to apply for the required permits, and contaminants from the facility are flowing toward a public drinking water supply.

DOE is asserting that EPA must revise the RCRA regulations to separately regulate mixed wastes. DOE further contends that States must be specifically authorized by EPA to regulate mixed wastes.

We find these assertions to be without legal basis, and a clear attempt to delay and obstruct the regulation of hazardous wastes at DOE facilities. Unfortunately, EPA is in agreement with the very innovative interpretation of RCRA.

I would like to emphasize that this is not merely a procedural or bureaucratic feud. DOE contends that its internal controls over hazardous wastes are equivalent to RCRA. This is not the case. At Rocky Flats, there are five unlined surface impoundments containing mixed wastes, which are believed to be contaminating ground water.

DOE has refused to submit a permit application for these facilities to the State. They have informed us that they have no intention of complying with the statutory mandate of installing double liners.

In conclusion, I would just like to state that the State of Colorado strongly supports congressional clarification of the mixed wastes issue.

Thank you.

Senator SIMPSON. I thank you very much, Mr. Slosky.

I wonder if each of you might comment just briefly on the Brookhaven survey of mixed wastes completed late last year for the NRC. Is this an accurate and comprehensive survey of the types and volumes of mixed wastes currently being generated in the commercial sector?

Mr. SCOVILLE. Senator, it is our view that the report is comprehensive only to the extent that the definition is well known for mixed wastes. We believe that definition is quite uncertain yet, and, therefore, the conclusions of the report are uncertain.

Senator SIMPSON. Doctor?

Dr. REBA. Senator, we recognize that the report is not complete, it is not thorough, it is not exhaustive, but we believe that it is a good approximation for information upon which action can be taken. The report can always be refined. It can always be more perfect. But it is probably good enough to make extrapolations and for action that the Senate can take. We are supportive of it.

Mr. NAYMARK. Our knowledge is limited to certain areas, but when they estimated somewhere between 2 and 3 percent of the low-level waste, which would put it at about 60,000 to 90,000 cubic feet, our chart shows about 90,000 total. So in that area, the numbers seem to be fairly close.

Senator SIMPSON. Thank you.

Mr. BERICK. Senator, the NRC is to be commended for getting us off the dime here, and giving us some kind of a common data base, which the report does do, for this discussion. We are very skeptical of a survey approach because we suspect that the worst actors are not going to come forward and admit that they have particular kinds of problems. I think that this is important.

There are certain problems with a survey approach. It is a good starting point, but it is not conclusive.

Senator SIMPSON. Thank you, Mr. Berick.

Mr. SLOSKY. We believe that the study is reasonably accurate on the wastes that routinely go to the low-level waste disposal sites. I, however, suspect that there are wastes, unusual wastes, so to speak, that were not captured in the survey.

We hear occasionally of generators that have PCB oils that are radioactively contaminated, and other unusual types of wastes. While this may appear to be small on a national basis, our site has just approved one such generator to ship 75,000 cubic feet of unusual kinds of wastes to the Beatty facility. We anticipate a similar volume in the next calendar year. So we suspect that the study is not comprehensive.

Senator SIMPSON. Let me ask Dr. Reba and Mr. Naymark. The largest percentage of the mixed wastes appear to be the scintillation vials.

You, Dr. Reba, might comment on how the groups that you represent have disposed of these in the past, how you are disposing of them today, and what other options do you have presently available to you for the storage and treatment, or disposal, of those vials.

Mr. Naymark, you could expand on your testimony just briefly. Are you capable of handling all of the scintillation vials currently generated at your Florida facility, and what sort of changes are you seeing now that the low-level disposal site operators are no longer accepting the scintillation vials for disposal?

Mr. NAYMARK. If all of the wastes that we know of were sent to the Gainesville facility, it would be less than 50-percent increase over what we have been handling. Our capacity is equal to that, without really any basic changes in the facility.

Dr. REBA. As I described in my testimony, most of the wastes produced by medical facilities and academic facilities now go to Mr. Naymark's firm in Florida, where they crush it and burn it as he described. To us, this technique could be improved. We personally believe that incineration is probably better. But it is satisfactory, and if the results of his surveys are accurate, and I have no reason to believe that they are not, then that is satisfactory.

Our only concern is that it is the only facility, and we are not comfortable being totally dependent on a single method and a single facility.

Senator SIMPSON. Let me ask jointly of Mr. Scoville, Mr. Berick, and Mr. Slosky. Do we have the regulations in place today to regulate the disposal of mixed wastes, if a shipper or a site operator wanted to dispose of this waste in one of the three licensed shallow land burial facilities?

Mr. SCOVILLE. At the moment, if I received a request to dispose of mixed wastes at my facility, I would have to turn it down. Not only are we not procedurally licensed or equipped to do that, but in fact if we were to undertake to come into some sort of compliance so that we could handle mixed wastes, we wouldn't know how. We wouldn't know what kind of facility to build, whose regulations to follow, or what kind of procedures to adopt.

Senator SIMPSON. Mr. Berick.

Mr. BERICK. Senator, I would have to agree with the statement. Regulations on the books today are not adequate to handle mixed wastes, either EPA's regulations or NRC's regulations in and of themselves.

Senator SIMPSON. Mr. Slosky.

Mr. SLOSKY. There certainly appear to be inconsistencies between the EPA and the NRC regulations. We think that it could be possible to design and permit a facility that would accept those types of wastes, but it would be a very difficult.

Senator SIMPSON. Would it make sense, from your respective standpoints, simply to prohibit the disposal of mixed wastes in existing and future sites so that the States and the compact regions could get on with the task of locating disposal sites for radioactive waste disposal, particularly if none of the currently operating low-level wastesites meet the requirements under RCRA that are necessary to accept mixed hazardous wastes?

Mr. SCOVILLE. Senator, I hate to keep harping about this definitional problem, but it is one that we face every day. I think that we need to define it very carefully so that site operators know when they are in compliance and when they are not.

To prohibit the disposal of mixed wastes, after it is defined, from all the low-level waste facilities today would mean that there is a large block of orphaned wastes in the country. I, personally, and my company have always been opposed to a number of temporary or interim storage facilities located all over the country. I think that it is far, far more prudent for us to properly dispose of the material.

If it takes some defining, then I think that the agencies involved in it should get on with the defining.

Mr. BERICK. Your proposal is the status quo, which is that those sites are not knowingly taking mixed wastes, although they probably are taking some wastes that we are not really sure about how they are defined.

We suggested segregation of these wastes, the mixed wastes, would help resolve these jurisdictional questions. Again, though, going back to current law, it isn't really clear that the Waste Policy Act requires facilities to take mixed wastes. They may, in fact, be required to remove that nonradiological hazard before they accept those wastes.

So it is an open question about what the obligation of States, under the Low-Level Waste Policy Act, to actually take mixed wastes, at least in my view.

Mr. SLOSKY. I am afraid that prohibiting the disposal, as you suggest, would not solve the problem from the States' point of view. Our interpretation under the Rocky Mountain Compact is that we would then be required to site two facilities, one to take nonmixed

low-level wastes, and then one to accept low-level mixed wastes. So prohibiting it from a traditional facility does not really relieve our obligation under our statute to dispose of that material.

Dr. REBA. Senator, may I make a simple point. It is impractical on a day-to-day basis to physically separate the radioactive waste from the chemical, organic, liquid waste before it is shipped. The only way to do it is in a combination of ways, either crushing it, and one would have to pick up each vial, pour it through some sort of a filter, sand, or something, and then store the vials in a certain place. The radioactive material and the organic material can be separated, but it is difficult, tedious, and potentially hazardous to the people who are doing it, much more so than the current methods.

Senator SIMPSON. If no changes are made legislatively, and existing sites don't meet the requirements necessary to accept it, and we don't get a definition, I agree with you, all of the mixed waste is going to be orphan waste, and that is a serious issue.

I have several other questions. I did desperately want to ask those, but we have a chairmen meeting at noon, and I must be there.

I want to thank you very much. You have added a dimension to our work that is very helpful. I want to thank each and every one of you for coming.

I want to thank the staff, Jim Curtis, Len Weiss, Dan Verkovitz, Steve Shimburg, and Kate Kimball for their work on this hearing.

Thank you so much for adding this to our efforts.

Mr. BERICK. Senator Simpson, could the record show that I reemerged from behind Mr. Naymark's sign?

Senator SIMPSON. We will say that you were only partially covered.

Mr. BERICK. Thank you, Mr. Chairman.

Senator SIMPSON. You were very good as he just closed you off there, I thought.

Thank you very much, I appreciate it.

[Whereupon, at 11:51 a.m., the subcommittee adjourned.]

[Statements submitted for the record, responses to additional questions, and the bill S. 892 follow:]

QUESTIONS AND ANSWERS

RELATING TO THE

MARCH 25, 1986, HEARING

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

AND THE

SUBCOMMITTEE ON NUCLEAR REGULATION

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

WITNESS: JOHN R. BARKER
DIRECTOR, OFFICE OF ENVIRONMENTAL AUDIT AND COMPLIANCE

QUESTIONS FOR THE DEPARTMENT OF ENERGY

MIXED WASTE HEARING

Question 1: Please identify all waste streams under the jurisdiction of the Department of Energy that contain both hazardous waste, as that term is defined in the Resource Conservation and Recovery Act, and source, special nuclear, or byproduct material, as those terms are defined in the Atomic Energy Act, mixed inseparably in a single waste stream. For each such waste stream, identify the source of generation, process or activity that results in the generation of such waste, the amount of waste generated on an annual basis, the hazardous substance contained in such waste stream, and the treatment, storage, management, or disposal practices used by DOE for each such waste stream.

Answer: Most of the information requested is contained in the enclosed series of draft waste stream reports* prepared in connecton with the Department's proposed rule on byproduct material. It should be noted that these are draft reports which are subject to revision.

*The reports referred to are retained in committee files.

Question 2: Please describe the applicability of RCRA to DOE facilities.

Answer: RCRA applies to DOE's nonradioactive hazardous waste. RCRA also applies, to the extent its application is not inconsistent with the requirements of the Atomic Energy Act, to the nonradioactive hazardous constituents in certain mixtures of chemical wastes and radioactive wastes which are other than "source, special nuclear, or byproduct material." RCRA does not apply to source, special nuclear, or byproduct material because of the specific exclusion of these materials from the term "solid waste," and thus from "hazardous waste," in Section 1004(27) of RCRA.

Question 3: Please describe how mixed wastes at DOE facilities are regulated.

Answer: The management, including disposal, of radioactive mixed waste, other than source, special nuclear, or byproduct, is subject to the Atomic Energy Act (AEA) for the radioactive constituents and to RCRA for the nonradioactive hazardous constituents. More specifically, the radioactive constituents are subject to DOE Order 5820.2, "Radioactive Waste Management," which establishes the policies and guidelines by which DOE manages its radioactive wastes; and the nonradioactive hazardous constitutents are subject to regulatory requirements promulgated under RCRA.

Question 4: Please summarize all procedural and substantive problems, if any, identified by DOE with respect to regulation of the mixed waste streams identified in response to question 1 under RCRA and the Atomic Energy Act.

Answer: While actual problems in the dual regulation of mixed wastes can only be determined on a case-by-case basis, we believe the main areas where problems may arise will involve conflicting technical requirements and national security considerations.

Question 5: What recommendations, if any, does DOE have for resolving these procedural and substantive problems in the framework of the existing law? Can any of these problems be resolved in the framework of the existing law?

Answer: The Department believes that the ongoing rulemaking effort with EPA, which is within the framework of existing law, will provide procedures to resolve problems relating to potential conflicting technical requirements and national security considerations.

Question 6: What recommendations, if any, does DOE have for new legislative authority to address these procedural and substantive problems? Please explain in detail the need and justification for any legislative modifications recommended by DOE.

Answer: As indicated in response to the previous question, the Department believes that potential problems can be worked out within the framework of existing law. Accordingly, the Department has no recommendation for new legislative authority at this time.

Question 7: Please comment on S.892. Do you support this bill? Please explain.

Answer: As indicated in the Department's prepared testimony on S.892, while the Administration does not have a current position on the bill, the Department has a concern that the language of Section 4.(C) of the bill could be construed as placing "source, special nuclear and byproduct material" under EPA's RCRA jurisdiction.

Question 8: Please summarize the status of DOE's proposed rulemaking on the definition of byproduct material. What impact, if any, will this rule, if adopted, have on the regulation of mixed wastes at DOE facilities?

Answer: The Department published the proposed rule on November 1, 1985. The comment period ended on January 2, 1986. DOE is now evaluating comments received on the proposed rule. In addition, the Assistant Secretary for Environment, Safety and Health has recently initiated a policy review of the byproduct issue including the proposed definition of byproduct material.

The rule, if adopted, would not affect the regulation of mixed wastes at DOE facilities. Rather, the rule if adopted would provide the basis for determining which waste streams are byproduct and subject to regulation exclusively by DOE under the Atomic Energy Act.

Question 9: What steps, if any, have DOE and EPA taken to ensure that the regulatory requirements of RCRA and the Atomic Energy Act are applied, with respect to mixed wastes, in accordance with the requirements of section 1006(a) of RCRA? ["Nothing in this Act shall be construed to apply to (or to authorize any State, interstate, or local authority to regulate) any activity or substance which is subject to . . . the Atomic Energy Act of 1954 . . . except to the extent that such application (or regulation) is not inconsistent with the requirements of such Act."]

Answer: DOE and EPA are working together on EPA rulemaking intended to implement Section 1006(a) of RCRA by providing the regulatory framework for resolving inconsistencies between RCRA and the Atomic Energy Act. The EPA rulemaking is planned to include; (1) variance provisions to prevent unauthorized disclosure of classified or defense-related information; (2) variance provisions for protecting against increased radiation hazards; and (3) provisions that would require identical variance provisions in State RCRA programs that would apply to DOE's AEA facilities.

Question 10: **Please summarize the status of all pending litigation involving the regulation of mixed waste resulting from or produced by DOE activities or facilities.**

Answer: There are currently two lawsuits concerning hazardous waste management at DOE facilities. One involves the Department's Savannah River Plant in South Carolina and was filed on September 24, 1985. The petitioners are four groups, including the Natural Resources Defense Council, and the State of South Carolina as an intervenor. The case has been continued until the next court session in October 1986.

The other lawsuit involves the Department's Feed Materials Production Center in Ohio and was filed by the State of Ohio on March 11, 1986. The Department's answer to the complaint is due no earlier than May 30, 1986.

PRE-HEARING QUESTIONS AND ANSWERS

SUBMITTED BY JOHN GLENN

RELATING TO THE

MARCH 25, 1986, HEARING

BEFORE THE

SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

AND THE

SUBCOMMITTEE ON NUCLEAR REGULATION

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

WITNESS: JOHN R. BARKER

DIRECTOR, OFFICE OF ENVIRONMENTAL AUDIT AND COMPLIANCE

Question 1: Do the revised ES&H orders give the Assistant Secretary of Environment, Safety and Health implementation and approval authority over all DOE ES&H activities? If not, please explain who has such authority and DOE's rationale for granting this authority to others.

Answer: DOE's revised Safety Orders give the Assistant Secretary for Environment, Safety and Health new and increased responsibilities and authorities for concurrence in program and project decisions. For example, in this most recent revision of the Orders significant programmatic decisions and actions such as start up of construction and operation of major facilities, and the approval of safety analysis reports and environmental implementation plans will now require the concurrence of the Assistant Secretary for Environment, Safety and Health. Other already existing approval authorities, such as the approval of Environmental Impact Statements have been retained. Additionally, the new Orders strengthen the functions of the Assistant Secretary in developing environmental and safety standards, policies, orders and guidance, and to conduct appraisals, reviews and audits of operating facilities.

In certain areas that reflect national security interests or a specific regulatory scheme established in legislation, the Assistant Secretary works closely with the cognizant DOE office to ensure proper program oversight. These areas are:

a. Naval Reactors Program: The Naval Reactors Program is an integrated effort carried out within both the Department of Energy and the Department of the Navy by a single organization under the Director, Naval Nuclear

Propulsion Program. Since its inception in the 1950's, the Naval Reactors Program has been responsible for all aspects of naval nuclear propulsion, including reactor safety, criticality control, nuclear safety, and personnel radiological control. These responsibilities were set forth in DOE regulations after the Department was created, and were subsequently described in Presidential Executive Order 12344 of 1 February 1982. Congress enacted these responsibilities into law by P.L. 98-525 of 19 October 1984.

The EH staff and the staff of the Naval Reactors Program work closely to assure that environmental activities within the Department of Energy are coordinated to permit consistent and proper application of requirements to all DOE facilities. For example, facilities which perform naval nuclear propulsion work are included in the environmental survey program covering all DOE facilities. Furthermore, EH regularly conducts employee occupational safety and health assessments at Naval Reactors Program facilities, which cover such areas as fire safety and workplace hazards.

b. Oversight of the design, testing and storage of nuclear weapons is assigned to the Assistant Secretary of Defense Programs. However, the Assistant Secretary for Environment, Safety and Health has full oversight authority over nuclear production plants and laboratories.

c. As required by E.O. 12196 dated 2/26/80, the Department of Labor has certain oversight responsibilities for Federal employee occupational safety and health programs, but assigns primary responsibility for employee health and safety matters to the head of each Agency. To be consistent with management practices elsewhere in the Federal government, the responsibility for this program within DOE is assigned to the Assistant Secretary for Management and Administration. Close coordination is maintained between the two offices, however, and, in some instances, the Assistant Secretary for Environment, Safety and Health, at the request of the Assistant Secretary for Management and Administration, provides technical assistance in conducting safety appraisals.

The revised Orders improve the system of checks and balances within the DOE organizational structure that are established to facilitate implementation of the Department's environmental and safety goals policies and programs.

Question 2: **What specific responsibilities will the Assistant Secretary have to ensure that ES&H problems such as reducing personnel Radiation exposure and minimizing air and water contaminating releases are corrected in a timely manner?**

Answer: The Assistant Secretary for Environment, Safety and Health is responsible for assuring conformance of the Department's activities with all applicable environmental laws and regulations and for assuring that the health and safety of workers and the public are protected. With respect to specific responsibilities for ensuring the timely correction of problems related to personnel radiation exposure, and releases of air or water contaminants, the Assistant Secretary has the responsibility for: (1) establishing DOE requirements for reporting, investigating, and correcting such problems; (2) investigating certain significant problems and directing corrective actions including, as appropriate, immediate corrective actions; and (3) overseeing the investigations and implementation of corrective actions conducted by other DOE organizations.

Program offices and field offices remain responsible for assuring that the fundamental design and operating characteristics of their program elements reflect good environmental practice and responsibility for correcting deficiencies in this area.

Question 3: When will these revised orders be implemented?

Answer: The revised Safety Orders have been transmitted to the field offices and programs for comment; we expect them to be finalized during April 1986.

Question 4: What measures have been taken to ensure that the environmental survey and technical appraisals will be truly independent? (e.g., To what extent will officials from other federal agencies and/or state governments participate in various survey and appraisal activities such as methodology development, field visits, problem identification, and input to anticipated remedial actions?)

Answer: The Survey is an internal management tool designed to identify current environmental problems and areas of risk and to prioritize them for corrective actions. It is neither an inspection nor an audit. The Survey, an initiative of Secretary Herrington's announcement in September 1985, is being conducted by the Assistant Secretary for Environment, Safety and Health; it is, thus, being conducted independently from the organizations that manage and operate the facilities being surveyed.

While the survey teams will be led by senior ES&H staff, they will include outside contractor support representing varied areas of scientific expertise necessary to address all media and areas of environmental regulation.

State agencies and EPA regional offices will be consulted prior to the survey of a particular site in order to explain in detail the Survey's methodology and to obtain information on state and EPA concerns with respect to the particular facilities being surveyed.

Each Technical Safety Appraisal team is also being led by ES&H senior staff and will include technical experts chosen for their expertise and years of experience.

Question 5: Have independent review panels been established to review the work performed and conclusions of the environmental survey and technical appraisals teams?

Answer: The Technical Safety Appraisal and the Environmental Survey teams will be led and managed by employees from the Office of Environment, Safety and Health, which is independent of the programs and offices managing the sites and facilities to be covered. In addition, the teams will include non-DOE contractor technical experts. Given the independence built into the Appraisal and Survey programs, we do not believe it is necessary to establish independent review panels.

Question 6: Will the extensive use of DOE staff to perform the environmental survey and technical appraisals have a negative impact on DOE ES&H staff's ability to effectively carry out its concurrent day-to-day ES&H responsibilities?

Answer: No negative impacts are anticipated. In the planning that led to the Secretary's new initiatives in environment, safety and health, it was recognized that the upgrading and refocusing of the ES&H function would require some additional resources. In FY 1986, additional resources totaling 15 full-time-equivalents and over $6 million will be devoted to the new Office of Environment, Safety and Health by realignment of staffing and funding resources from other elements of the Department. The President's FY 1987 budget request for this Office provides for further resource increases of an additional 2 full-time-equivalents and an additional $29.2 million. In addition, while the Technical Safety Appraisals and the Environment Survey will be led by ES&H staff, they will maximize use of contractor and DOE National Laboratory technical experts. I am confident that sufficient resources are being devoted to the Office of Environment, Safety and Health.

Question 7: Are there any plans for DOE ES&H field staff to report directly to DOE headquarters rather than through the operations offices?

Answer: No.

STATEMENT OF
MARCIA E. WILLIAMS
DIRECTOR, OFFICE OF SOLID WASTE
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
AND
SUBCOMMITTEE ON NUCLEAR REGULATION
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

March 25, 1986

Good morning Mr. Chairmen and members of the Subcommittees. I am Marcia E. Williams, Director of the Office of Solid Waste at the U.S. Environmental Protection Agency.

INTRODUCTION

We appreciate the opportunity to appear before you to discuss EPA's activities related to mixed hazardous and radioactive waste. In my prepared testimony, I will first discuss the various types of radioactive wastes and the regulatory authorities for addressing them. I will then discuss some problems that have arisen because, while the various agencies and statutes involved in regulating this waste all have the same goal -- to protect human health -- it is difficult to determine how best to provide protection from a waste which presents two different hazards. Finally, I will discuss some options we have identified for resolving these issues.

You have posed a number of specific questions to us in your March 19, 1986 letter of invitation to Lee Thomas. We will submit formal responses to these questions for the record. In particular, the Administration has not yet developed a position on S. 892. We will comment on this in our formal responses.

REGULATORY BACKGROUND

Radioactive Waste Categories

The first type of radioactive waste is "source, special nuclear, and by-product material," as identified in the Atomic Energy Act (AEA). The Resource, Conservation and Recovery Act (RCRA) expressly excludes these materials from regulation as a solid waste. However, since by-product material is not clearly defined in the AEA, the scope of wastes covered by the RCRA exemption has been uncertain. The Department of Energy (DOE), the Nuclear Regulatory Commission (NRC) and EPA have been negotiating and exchanging proposals on this question, and in November 1985, DOE issued a proposed rule defining "by-product" material.

The next waste category is so-called "mixed waste". This is waste that is not by-product material but which contains hazardous waste (as defined by the Resource Conservation and Recovery Act (RCRA)), mixed with source,

special nuclear or by-product material. This type of waste is covered under both the AEA and RCRA.

A third waste category of concern to EPA is naturally-occurring and accelerator-produced radioactive material (NARM) waste. This waste is not subject to the AEA. While the waste could be regulated under RCRA, such listing might not be appropriate because the hazards from NARM waste appear to stem from its radioactive nature.

NRC Involvement

The Nuclear Regulatory Commission is responsible for, among other things, licensing and regulating facilities which dispose of commercial low-level radioactive waste. NRC in turn delegates its licensing authority to "agreement" States. There are currently three operating commercial low-level radioactive waste sites in the United States: at Hanford, Washington; Beatty, Nevada; and Barnwell, South Carolina. Under the Low-Level Radioactive Waste Policy Act, approximately 8 to 10 new commercial sites are expected to be developed by 1993. In addition, there are a number of on-site NRC-licensed low-level radioactive waste units currently in operation which

may handle mixed waste. NRC itself neither generates low-level radioactive waste nor operates low-level radioactive waste facilities.

To get a measure of the amount of mixed waste going to commercial NRC-licensed sites, NRC, through the Brookhaven National Laboratories, conducted a survey of generators and sites. The survey identified three basic waste types that may currently qualify as mixed waste. These are: (1) waste containing organic liquids (e.g., scintillation fluids), (2) wastes containing lead (e.g., shielding and containers), and (3) wastes containing chromium. Brookhaven estimated that 80,000 cubic feet per year (1500 tons) or only about 1 to 3 percent of the total waste disposed of at commercial NRC licensed low-level radioactive waste sites are in these three categories. These wastes are generated by commercial reactors, academic institutions, medical institutions, and some industries. The study also indicated that the rate of mixed waste generation should decline as waste minimization measures are put into place.

DOE Involvement

The Department of Energy generates low-level radioactive waste, NARM waste and high-level radioactive waste, as well as "pure" RCRA hazardous waste. The radioactive waste is generated from the production of nuclear materials used in weapons and fuels

(e.g., uranium enrichment), and from research activities, at 15 major facilities operated by DOE. DOE also has conducted a study of its plants, identifying wastes that are source, special nuclear, by-product, mixed, RCRA hazardous, and non-hazardous. The initial results showed that DOE generates about 12 million tons per year of waste that might be mixed waste. This waste is mostly liquid waste containing various hazardous constituents (e.g., solvents and heavy metals).

DOE contractors also operate radioactive waste disposal sites. DOE itself establishes and implements health and safety standards for these sites, but licensing is not required.

EPA Involvement

EPA has jurisdiction over NRC-licensed and DOE-operated facilities through at least two statutes: RCRA and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). RCRA gives EPA authority to regulate solid and hazardous waste management activities. Mixed waste can also be regulated under RCRA.

At present, however, no State has received RCRA authorization to regulate mixed waste. Because of uncertainty about the precise identity of mixed waste and about which rules apply to it, we have deferred State RCRA authorization until we resolve how mixed waste will be regulated. This means that States do not now regulate mixed waste under EPA-authorized RCRA programs.

CERCLA applies both to hazardous substances under RCRA and to radionuclides subject to the AEA. Under CERCLA, EPA can place both DOE and NRC-licensed sites on the national list of priority sites to be remediated. The DOE Rocky Flats plant in Colorado, the DOE/Army Weldon Spring Quarry in Missouri and the DOE Lawrence Livermore Laboratory in California are examples of DOE sites listed or proposed for listing on the National Priorities List. Under CERCLA, both facility owners and operators and the original waste generators at NRC-licensed facilities are potentially liable for cleanup and other remedial costs.

EPA is currently engaged in several activities with respect to mixed waste. As noted earlier, we have been exchanging information with DOE and NRC on how to define the term "by-product material" in the AEA, so that the scope of the mixed waste universe becomes clear. We believe we can work with these sister agencies to resolve this question.

As I will discuss in more detail in a moment, we also have been working with DOE to resolve, by regulation, national security concerns which might arise because of RCRA. In the same regulation, we're also working to devise a process to reconcile potential conflicts between DOE's and EPA's treatment of mixed waste, to ensure public health is protected in cases where management standards for the components of the mixed waste differ.

-7-

CONCERNS

The basic difficulty in regulating mixed waste is one of multiple jurisdiction and different regulatory approaches. Other problems have included the lack of a functional definition of the wastes excluded under RCRA (specifically a "by-products material" definition); the issue of national security in RCRA permitting, compliance monitoring and enforcement at some DOE facilities; and administrative problems associated with dual permitting.

I don't believe that these problems are unresolvable. They are, however, quite complex and difficult to address, as witnessed by our presence here today. All three agencies involved have worked to settle these questions and we have made significant progress. As I will discuss, however, I believe that for some of our problems, the best solution may require action by more than just the agencies. Let me discuss these problems in a little more depth.

Problems Which Can Be Resolved Now

We believe the following issues can be resolved using current statutory authority.

1. Conflicts Between RCRA and AEA Standards for Mixed Waste

Regulations and policies implementing the AEA are designed to minimize worker exposure to radiation and to isolate radionuclides, primarily through containerization, geologic attenuation and site location, until they decay.

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This approach, designed to address radioactive hazards, is not necessarily the best philosophy to address chemical hazards, however, nor is the RCRA/EPA approach to protecting against chemical hazards necessarily an appropriate way to deal with radioactive materials. In some instances, applying RCRA regulations to radioactive waste or AEA regulations to chemical waste could produce a net increase in risk.

We are now attempting to resolve this type of problem with DOE. We are working on developing a regulatory variance to waive RCRA rules when compliance would cause a net increase in risk. For example, RCRA requires a facility owner to open, inspect and analyze containers of waste upon arrival. This practice, when used with mixed waste, could result in substantial risk to workers. The variance thus might waive the RCRA waste analysis requirement. While to date we have considered this approach only for permitting at DOE facilities, it probably also could be used for addressing mixed waste at NRC-licensed sites. Our authority for both such variances would come from RCRA Section 1006, which states that nothing in RCRA "shall be construed to apply to any activity or substance which is subject to . . . [the AEA]" unless the rule would be consistent with the AEA's requirements.

2. "By-Product Material" Definition

As I noted earlier, EPA, DOE and NRC have been working together to develop a definition of "by-product material", and thereby also define what is mixed waste. EPA and NRC are participating in the current DOE rulemaking, and we believe the issue can be resolved.

3. National Security Concerns

As I also alluded to earlier, DOE is concerned that submitting certain permit application information for the public record and allowing free access to their sites could compromise national security. EPA is addressing this concern by developing a regulation to allow these RCRA requirements to be modified, while at the same time assuring that properly cleared personnel have access to all relevant information and facilities pertaining to hazardous waste. As with the rule we are developing to address conflicts between EPA and DOE operating standards, we are drafting this rule under RCRA Section 1006.

4. State Authorization

Until questions are resolved concerning what mixed waste is and how it should be regulated on a Federal level, we have chosen not to authorize States to regulate mixed waste. Once these issues are settled, we intend to make mixed waste part of our State authorization package.

Problems Which Cannot Be Resolved Now

1. Multiple Jurisdiction and Dual Permitting and Enforcement for Mixed Waste

Under the present regulatory scheme, management of mixed waste is governed by three Federal agencies under two statutes. This means three sets of potentially inconsistent regulations

and, for NRC-licensed sites, two permits. This situation is not workable and may be inefficient.

We believe this situation could be addressed by minor legislative action. We see two basic options.

1. Separate Jurisdiction Based on Primary Concern

Congress could divide the mixed waste universe into three pieces, with each piece regulated by a single authority, NRC, DOE or EPA. One way to do this would be to examine each waste stream and assign jurisdiction based on the primary concern about the waste stream (i.e., radioactivity or other hazards). A specific radiation level, for example, could be used to determine primary concern. The agency assigned jurisdiction would then be solely responsible for permitting, regulating, and enforcing for both radioactive and other hazards, as appropriate. Mixed waste going to an NRC licensed or DOE site would be exempt from RCRA, and mixed waste going to RCRA sites would be exempt from the AEA.

One problem with this option would be deciding what criteria to use to determine the primary concern and/or to assign jurisdiction. In addition, since RCRA is a dynamic program,

this approach likely would require a waste stream evaluation each time there is a new RCRA hazardous waste characteristic or waste listing. This requirement for continuous re-evaluation could be modified, however. For example, we could create a mechanism which would cluster RCRA amendments to the RCRA rules and only periodically mandate that NRC licensees or DOE pick up these changes.

This option would require a statutory change to exempt certain mixed waste from the AEA or RCRA.

2. Delegation of Authority

A second option would be to continue to have multiple jurisdiction, but to enable delegation of permitting and enforcement to one agency and provide for that agency, in turn, to delegate to its implementing States. This approach could work in one of two ways: (1) delegate RCRA permitting to NRC (i.e., NRC would issue the RCRA permit at AEA/NRC sites) or (2) delegate AEA licensing to EPA (i.e., EPA would issue the AEA/NRC-license at RCRA sites). Once again, the agency with jurisdiction could be determined based on the primary concern with the waste stream. Either delegation would require a legislative amendment to the statute whose authority is delegated.

This approach still would require EPA and NRC to resolve regulatory conflicts or differences, but it would avoid the problems and costs of dual permitting and enforcement. While NRC is now considering this approach, they are concerned about the dynamic nature of EPA's RCRA rules -- for example, we will be issuing location standards and listing new wastes in the next few years. They also are concerned about the scope of the new RCRA corrective action provisions. NRC believes that such a changing program could have an impact on the States' ability to develop NRC-licensed sites by 1993.

EPA is sympathetic with NRC's legitimate concerns about accepting mixed waste. It is important to note that this same problem would arise even under the dual permitting status quo -- NRC would still have to assume the entire RCRA program. These concerns could be allayed, however, if Congress also gave EPA clear authority to modify its standards for mixed waste.

3. NARM Waste

The final issue which cannot be resolved optimally by using current authorities is disposal of NARM waste. RCRA facilities can legally accept NARM waste. However, since NARM's primary, if not sole, hazard is radioactivity, arguably the most logical disposal site for it is at an NRC-licensed facility.

Because NARM waste is not covered by the AEA, however, NRC would have no authority under which to issue standards addressing it. Congress therefore would have to amend the AEA. In addition, if EPA were to list NARM waste as a RCRA hazardous waste, RCRA operational requirements such as double liners and leachate collection systems would apply to NARM at NRC sites. Since we currently have little authority to waive RCRA requirements for NARM wastes (because RCRA Section 1006 only allows a waiver to AEA wastes), RCRA would have to be amended to permit such a waiver, unless Congress amended the AEA to include NARM.

CONCLUSION

As you can see, there are a number of complex technical and legal issues involved in addressing mixed and other radioactive waste. Based on the Brookhaven and other studies, we are working with NRC to better define the extent of the problem with NRC accepting mixed waste and to determine the best way to address it. As we get more information, we will be able to develop more specific options for your consideration. We are also moving forward with EPA rulemaking on DOE's concerns about national security and potential conflicts between EPA and DOE operating requirements.

Thank you for this opportunity to address the Subcommittees. I would be happy to respond to any questions you might have.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 30 1986

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Honorable Alan K. Simpson, Chairman
Subcommittee on Nuclear Regulation
United States Senate
Washington, D. C. 20510

Dear Senator Simpson:

In your letter of March 19, 1986, you posed a number of questions pertaining to the Subcommittees' joint hearing on March 25 on the regulation of mixed hazardous and radioactive substances under the Resource Conservation and Recovery Act and the Atomic Energy Act.

Our responses to these questions are enclosed. Please let me know if we can provide further assistance on this issue.

Sincerely,

J. Winston Porter
Assistant Administrator

Enclosure

ANSWERS TO QUESTIONS FOR THE ENVIRONMENTAL PROTECTION AGENCY

JOINT MIXED WASTE HEARING -- MARCH 25, 1986

Question 1:

Please identify all waste streams that contain both hazardous waste, as that term is defined in the Resource Conservation and Recovery Act, and source, special nuclear, or byproduct material, as those terms are defined in the Atomic Energy Act, mixed inseparably in a single waste stream. Please include in your analysis all such waste streams, including, but not limited to mixed wastes currently defined by the NRC as low-level radioactive waste. For each such waste stream, identify the source of generation, the process or activity that results in the generation of such waste, the amount of waste generated on an annual basis, the hazardous waste substance contained in such waste stream, whether such hazardous substance is currently regulated or is subject to regulation pursuant to RCRA, and all treatment, storage, management, or disposal options currently permitted, licensed, or otherwise authorized by EPA or by the NRC (or an Agreement State) for such waste.

Answer:

The information requested concerning NRC-regulated wastes is contained in two NRC reports:

(1) An Analysis of Low-Level Wastes: Review of Hazardous Waste Regulations and Identification of Radioactive Mixed Wastes (NUREG/CR-4406). This report describes the types and volumes of mixed waste currently being generated and disposed of by commercial NRC-licensed facilities. Analyses of waste streams were not conducted for this survey, however, and respondents to NRC's survey account for only 29 percent of the total low-level radioactive waste (LLRW) disposed of in 1984. The survey focused on three broad categories that may be radioactive mixed wastes: waste containing organic liquids called liquid scintillation wastes (2.3% of LLRW), wastes containing lead shielding or lead containers (.1% of LLRW), and wastes containing chromium (.7% of LLRW).

(2) Management of Radioactive Mixed Wastes in Commercial Low-level Wastes (NUREG/CR-4450). This is a draft report which is subject to revision.

DOE also has conducted mixed waste stream studies. Reports from these studies are now in draft form. The drafts are being revised and the revisions have not yet been provided to EPA. The drafts identify numerous DOE mixed wastes. The majority contain contaminated solvents or used oil. DOE generates roughly 12 million tons per year of mixed waste.

Question 2:

In December of 1985, the NRC published a report entitled "An Analysis of Low-Level Wastes: Review of Hazardous Waste Regulations and Identification of Radioactive Mixed Wastes" (NUREG/CR-4406). Is this report, in your judgment, a comprehensive summary of all low-level radioactive mixed wastes that are currently of regulatory concern to the EPA from the standpoint of EPA's regulatory responsibilities under RCRA? Is this report a complete and accurate depiction of the volumes and types of such waste, as well as the sources of generation?

Answer:

EPA believes that the NRC report is generally accurate in describing low-level radioactive mixed waste that is regulated by NRC. However, EPA personnel did not perform an on-site evaluation of the wastes. In addition, the report is not complete in that the survey accounts for only 29 percent of such NRC-regulated facilities. Furthermore, the report does not address low-level radioactive mixed waste that is generated and managed by DOE.

Question 3:

With respect to the hazardous substances contained in the mixed waste streams identified in response to question 1, has EPA promulgated all of the regulations necessary to implement RCRA (including the 1984 amendments to RCRA)? Specifically, has EPA established all regulations necessary for: (i) any interested party to file an application with EPA for a permit to construct and operate a facility to dispose of such mixed wastes; and (ii) EPA to evaluate and approve such an application? If not, what additional regulations will be necessary, what issues will those regulations address, and when will those regulations be in place? In the absence of such regulations are there any existing facilities in which EPA permits such mixed wastes to be disposed of? If so, where? What steps, if any, would these facilities be required to take upon promulgation of EPA's regulations to implement the 1984 amendments to RCRA?

Answer:

The existing RCRA regulations and regulations being developed under the 1984 Hazardous and Solid Waste Amendments to RCRA pertain only to the hazardous components of mixed waste. The radioactive components are regulated under the AEA. Thus, it would be necessary for a party interested in constructing or operating a commercial facility that handles mixed waste to obtain a permit from EPA and a license from NRC. EPA is planning to propose amendments to its RCRA regulations addressing national security and radiation hazard aspects of mixed waste at DOE facilities.

Question 4:

Are there any other statutes, aside from RCRA and the Atomic Energy Act, that apply to the disposal of low-level radioactive mixed wastes? If so, please summarize the requirements of those statutes. Has EPA promulgated all necessary regulations to implement the requirements of these statutes with respect to the disposal of low-level radioactive mixed wastes?

Answer:

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Clean Air Act (CAA) both apply to the disposal of low-level radioactive waste. Hazardous and radioactive releases from a low-level radioactive disposal site would be subject to CERCLA. Low-level radioactive waste sites are subject to the CAA relative to radiation releases to the air.

Question 5:

With respect to the source, special nuclear, or byproduct material contained in the low-level radioactive mixed waste streams identified in response to question 1, does EPA impose any regulatory requirements to protect the public health and safety and the environment from the hazards posed by such materials? If so, please describe those requirements.

Answer:

Through EPA's Office of Radiation Programs, and pursuant to the AEA, regulations are being developed that would establish the minimum health standards relative to radiation release from low-level waste disposal facilities. In addition, EPA has already issued such rules (40 CFR 191) pertaining to high-level waste disposal. These standards include limits on releases over 10,000 years, exposure to individuals, contamination of ground water, and assurance requirements of a qualitative nature.

Question 6:

With respect to the hazardous substances contained in the low-level radioactive mixed waste streams identified in response to question 1, do the regulatory requirements currently imposed by the NRC (i.e., 10 CFR Part 61) provide a level of protection that is adequate to protect human health and the environment, as required under RCRA, if those wastes are disposed of in a low-level radioactive waste disposal facility licensed pursuant to Part 61?

Answer:

This question cannot be answered fully at this time, since there has never been a comprehensive analysis of the two regulations

to determine equivalent protection. On the surface, however, it appears that NRC's rules may not provide equivalent protection since they do not require protective measures similar to RCRA standards; e.g., liner and leachate collection systems that were mandated by Congress in the 1984 RCRA Amendments.

Question 7:

Aside from disposal in a licensed low-level radioactive waste disposal facility, what other options are available for the treatment or management of low-level radioactive mixed wastes? Can any or all of these wastes be effectively incinerated? If so, which ones? Are there facilities available that provide such a service? If so, where? Can any or all of these wastes be decontaminated, either through chemical, mechanical, or other processes? If so, which ones? Are there facilities available that provide such a service? If so, where? Aside from these options, are there other alternative management or treatment options now available, or likely to be available in the future, that would eliminate or minimize the need to dispose of low-level radioactive mixed wastes in a licensed low-level radioactive waste disposal facility? Can low-level radioactive mixed wastes be treated or managed so that disposal in a licensed low-level radioactive waste disposal facility is not necessary?

Answer:

Some constituents in low-level wastes can be effectively incinerated. These include such wastes as solvents, paper, wood, clothing, and plastics. If a mixed waste is involved, however, the incinerator would need both a RCRA permit and an AEA license. Currently, DOE has a facility in New Mexico for incinerating PCB mixed waste. This is primarily a research unit located at Los Alamos. Quadrex PHS, Inc., in Gainesville, Florida, handles liquid scintillation vials.

Decontamination can also be a method for managing low-level wastes. The facilities engaged in these activities are primarily recyclers of slightly contaminated materials (heavily contaminated materials are avoided). Those wastes most likely to be a candidate for decontamination are reusable materials--e.g., tools, machinery, equipment, and protective clothing. EPA is not aware of any commercial facilities that decontaminate mixed waste itself.

The NRC study identified in question 1, Management of Radioactive Mixed Waste in Commercial Low-level Wastes, addresses management options for eliminating mixed waste streams from commercial low-level waste. In summary, the NRC report describes methods that can be implemented today for reducing or eliminating mixed waste from commercial low-level waste.

Question 8:

Please summarize all procedural and substantive problems identified by EPA with respect to the regulation of low-level radioactive mixed waste, if such waste is required or allowed to be disposed of in licensed low-level radioactive waste disposal facilities?

Answer:

The major procedural problem associated with the disposal of mixed waste at an NRC-licensed facility is dual permitting to comply with the requirements under both RCRA and AEA. (Dual permitting is not a concern at DOE facilities because DOE does not issue permits under the AEA.) These requirements sometimes are in conflict. For example, RCRA Section 264.13(a)(4) requiring inspection or analysis of waste is an issue since it might expose workers to radiation.

The major substantive problems identified appear to be RCRA requirements for liners and leachate collection, corrective action, and banning the land disposal of specific waste (all required by the 1984 RCRA amendments).

Question 9:

What recommendations, if any, does EPA have for resolving these procedural and substantive problems in the framework of the existing law? Can any of these problems be resolved in the framework of the existing law?

Answer:

As mentioned earlier, EPA is planning to propose amendments to its RCRA rules addressing radiation hazard aspects of mixed waste this summer. We believe these amendments will allow resolution of some of the substantive problems in the framework of the existing law.

Question 10:

What recommendations, if any, does EPA have for new legislative authority to address these procedural and substantive problems? Please explain in detail the need and justification for any legislative modifications recommended by EPA.

Answer:

As for the major procedural problem (dual AEA/RCRA permits), EPA recommends legislative amendment to RCRA. As currently written, RCRA does not allow EPA to delegate authority to another Federal agency, such as NRC, to issue RCRA permits. The States, in turn, can be delegated authority to regulate mixed waste as

part of the RCRA program. This is a viable solution to dual permitting for NRC Agreement States where NRC-licensed facilities are located. It does not resolve potential substantive differences, however.

For DOE facilities, dual permitting is not a concern under either Federal or State rules. In the event of disputes (e.g., whether certain RCRA rules should be waived because they would increase the radiation hazard) between a State and DOE, the State could consult EPA or, if it disagrees with attempts to reconcile differences, institute court action to resolve the issue.

Question 11:

Does EPA support the procedural approach established in Section 11 of S.1578, as passed by the Senate, for resolving any conflicts between EPA and NRC in the regulation of low-level radioactive mixed wastes? Specifically, does EPA support the delegation of EPA's RCRA permitting authority, in the manner described in section 11(c)(2)?

Answer:

EPA has two concerns with S. 1578, Section 11. These concerns are:

(1) The Bill as now written would create an "orphan" waste. The orphan waste would be that which NRC banned under Section 11(c)(3), and which RCRA sites would not want to take because of concerns over the radioactive aspect of the waste.

(2) The Bill does not address Naturally Occurring and Accelerator-Produced Radioactive Materials (NARM). NARM wastes that are low level could, of course, be handled at low-level radioactive waste sites. The AEA does not provide authority to regulate NARM wastes. RCRA does provide EPA with such authority, but we do not currently regulate NARM wastes. Most States, however, do have controls for such wastes.

Question 12:

Please comment on the Department of Energy's proposed ruling on the definition of byproduct material. Will this rulemaking affect EPA's regulation of hazardous substances and mixed wastes?

Answer:

In December 1985, DOE formally proposed a definition of byproduct material. EPA commented on the proposal in February 1986, stating that a rule defining "byproduct material" was not necessary, and that the facility waste stream studies should be the basis for a RCRA/DOE mixed waste program. In effect, we believe that the two agencies (DOE/EPA) can resolve the issues by getting together and determining what is covered by RCRA and what is not.

Mixed waste will continue to be regulated under RCRA, regardless of whether or not the byproduct rule is promulgated. The proposed definition could, however, affect what is considered to be "mixed waste."

Question 13:

What impact, if any, will EPA's currently ongoing revision of its RCRA regulations, including those revisions necessary to conform to the 1984 Amendments to RCRA, have on the ability of the States to meet their obligations pursuant to Public Law 99-240? Will these revisions have any impact on the ability of the States to meet the milestones, or any other requirements, in Public Law 99-240? Will the regulations, currently under development by EPA to implement the 1984 RCRA Amendments apply to a low-level radioactive waste facility that accepts low-level radioactive mixed waste for disposal? If so, what impact will this have on the selection, licensing, construction, and operation of sites in accordance with the framework established in Public Law 99-240?

Answer:

EPA's response to the 1984 Hazardous and Solid Waste Amendments will require a number of major modifications (e.g., location standards, air standards, and new waste listings and characteristics) to the RCRA standards over the next few years. These new rules could have an impact on the State programs under RCRA and the AEA. They could have have an impact on the siting and permitting/licensing of new low-level radioactive waste facilities by 1993, as required by the Low-Level Radioactive Policy Act Amendments of 1986, if these facilities also handle hazardous or mixed waste. Since RCRA standards apply to mixed waste, it would be necessary for States to comply with both RCRA and NRC requirements. There are differences between these regulatory requirements--such as RCRA requirements to analyze waste and to collect and remove leachate at disposal sites--that would have to be reconciled with NRC requirements. In addition, State RCRA programs will be under continuous revision in order to maintain the statutorily mandated equivalence to the Federal RCRA program as new rules are promulgated. The uncertainty of RCRA requirements might affect States abilities to site LLW facilities, if these facilities were also intended to handle mixed waste. We would note, however, that any regulatory program is subject to review and revision at any time. This situation is not unique to RCRA.

Question 14:

What steps, if any, have EPA and NRC taken, to ensure that the regulatory requirements of RCRA and the Atomic Energy Act are applied, with respect to low-level radioactive mixed wastes, in accordance with the requirements of section 1006(a) of RCRA? ["Nothing in this Act shall be construed to apply to (or to

authorize any State, interstate, or local authority to regulate any activity or substance which is subject to....the Atomic Energy Act of 1954...except to the extent that such application (or generation) is not inconsistent with the requirements of such Act."]

Answer:

EPA and NRC are working together to coordinate their regulatory responsibilities for mixed waste. The preparation of the two NRC reports cited in the answer to question 1, which identify the universe of mixed waste, was an essential first step.

In addition, EPA, NRC, and DOE are examining two options to ensure consistency between RCRA and the AEA: separate jurisdiction based on primary concern and delegation of authority. Under the first option, Congress could divide the mixed waste universe into pieces, with each piece regulated by a single authority (NRC or EPA) under only one statute. The waste would then be exempt from regulation by the other statute. One way to do this would be to examine each waste stream and assign jurisdiction based on primary concern about the waste stream (i.e., radioactivity or other hazards). One problem with this option would be deciding which criteria to use to determine the primary concern and/or to assign jurisdiction. In addition, since RCRA is a dynamic program, this approach likely would require a waste stream evaluation each time there is a new RCRA hazardous waste characteristic or waste listing. This requirement for continuous reevaluation could be modified, however. For example, we could create a mechanism that would cluster amendments to the RCRA rules and only periodically mandate that DOE and NRC pick up these changes. This option would require a statutory change to exempt certain mixed waste from the AEA or RCRA.

The second option for issues relating to NRC would be to continue to have multiple jurisdiction, but to enable delegation of permitting and enforcement authority to one agency and provide for that agency, in turn, to delegate to its implementing States. This approach could work in one of two ways: (1) delegate RCRA permitting and enforcement to NRC (i.e., NRC would issue the RCRA permit at AEA/NRC sites) or (2) delegate AEA licensing and enforcement authority to EPA (i.e., EPA would issue and enforce the AEA/EPA license at RCRA sites). Once again, the agency with jurisdiction could be determined based on the primary concern with the waste stream. Either delegation would require a legislative amendment to the statute whose authority is delegated.

This approach still would require EPA and NRC to resolve regulatory conflicts or differences, but it would avoid the problems and costs of dual permitting and enforcement.

Question 15:

Please describe the applicability of RCRA to Department of Energy facilities.

Answer:

RCRA applies to all DOE facilities that generate, store, treat, or dispose of hazardous waste.

Question 16:

Please describe how mixed wastes at Department of Energy facilities are regulated under RCRA.

Answer:

DOE facilities are currently subject to RCRA if they generate, store, treat, or dispose of hazardous waste. The majority of States are authorized to operate hazardous waste control programs in lieu of the Federal EPA program. Mixed waste, however, is currently beyond the scope of authorized State programs. Therefore, in these States, mixed waste can be regulated only under State law. In unauthorized States, however, EPA has authority to regulate mixed waste.

Question 17:

Please comment on S. 892. Do you support this bill? Please explain.

Answer:

This bill would amend the RCRA definition of "solid waste" to include source, special nuclear or byproduct materials when those materials are mixed with solid waste, and (1) when those materials are in the generation, transportation, storage, or treatment stage, or (2) when those materials are disposed of at an AEA facility of DOE or other unlicensed locations. Section 5 provides that these amendments shall not be construed as altering the intent of Congress as to whether RCRA applies to mixed waste disposed of at NRC-licensed facilities. Despite this disclaimer, the bill does raise questions as to EPA's authority over mixed waste at NRC-licensed facilities because it is not mentioned explicitly in Section 4 with DOE wastes. Waste disposed of at a "repository" (under the Nuclear Waste Policy Act of 1982) would also not be included as solid waste under RCRA control. For these reasons, EPA would suggest a modification in language to clarify these points.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 3 1986

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OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Honorable Alan K. Simpson
Chairman, Subcommittee on Nuclear
Regulation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

Thank you for your letter of April 16. We appreciated the opportunity to testify before the Subcommittee on Nuclear Regulation and the Subcommittee on Environmental Pollution on March 25, 1986. Enclosed are responses to post-hearing questions from Senator Stafford, Senator Lautenberg and yourself.

We will continue to work with the Department of Energy and the Nuclear Regulatory Commission to resolve the mixed waste issues facing our agencies. Thank you for your interest in this very important matter.

Sincerely,

J. Winston Porter
Assistant Administrator

Enclosures

RESPONSES TO SENATOR ALAN K. SIMPSON

1. Since we first became involved in the mixed waste issue a number of years ago, it has always seemed to me that there has been considerable confusion over exactly what is and what is not classified as mixed waste. Based upon the work that the Brookhaven National Lab has just recently completed, do we now have a good sense of the volumes, sources and types of mixed wastes generated by NRC licensees that the Federal agencies agree upon?

The NRC report appears to be generally accurate in describing low-level radioactive mixed waste that is regulated by NRC. The report is not complete in that the survey accounts for only 29 percent of such NRC-regulated facilities. Furthermore, the report does not address low-level radioactive mixed waste that is generated and managed by DOE. This study has become a focus for further discussions between EPA and NRC.

Another type of waste of related concern is naturally occurring and accelerator produced radioactive materials (NARM). The study also does not address NARM waste which is not regulated under the Atomic Energy Act (AEA).

2. Do you agree with the Brookhaven conclusion that approximately three percent of the total low-level waste is mixed waste, and that it comes primarily from three sources: (A) organic liquids associated with scintillation vials; (B) lead shielding; and (C) chromates from ion exchange resins used in power reactors? Do you agree that the Brookhaven study provides us with sufficient information with regard to who is generating mixed waste and in what amounts?

The report appears to be accurate, subject to the limitations discussed above.

3. Aside from disposal of this waste in a low-level waste disposal facility, are there other options -- such as incineration or decontamination -- that might minimize or eliminate the need to dispose of these mixed wastes in disposal facilities that should be pursued or encouraged?

Some constituents in low-level wastes can be effectively incinerated. These include such wastes as solvents, paper, wood, clothing and plastics. Decontamination can also be a method for managing low-level wastes. The facilities engaged in these activities are primarily recyclers of slightly contaminated materials (heavily contaminated materials are avoided). Those wastes most likely to be a candidate for decontamination are reusable materials, such as tools, machinery, equipment and protective clothing.

The Brookhaven report also addresses management options that can be implemented today for reducing or eliminating mixed waste streams from commercial low-level waste.

4. Do we have the regulations in place today to regulate the disposal of mixed waste, if a shipper or a site operator wanted to dispose of that waste in one of three licensed shallow land burial facilities?

The existing RCRA regulations pertain to the hazardous component of mixed waste. The radioactive components are regulated under the AEA. Facilities handling mixed wastes are thus subject to regulation under both statutes.

5. Assuming that this waste does, in fact, contain a hazardous substance subject to regulation under RCRA, do any of the currently operating low-level waste disposal facilities meet all of the requirements that are necessary, in the judgment of EPA and NRC, to safely dispose of mixed waste?

This determination has not been made because mixed wastes are not subject to RCRA jurisdiction in authorized States. EPA's hazardous waste control programs, including enforcement, are designed to ensure all hazardous waste, including mixed waste, is managed in accordance with applicable regulations. EPA is proceeding to authorize States to regulate mixed wastes and we will shortly issue a notice in the Federal Register advising authorized States that they must demonstrate to EPA authority to regulate mixed wastes.

6. Are the regulations that have been established by the NRC for low-level waste disposal under Part 61 adequate, in your view, to provide a degree of protection comparable to that afforded under RCRA, if mixed waste is disposed of in one of these sites?

Two different concerns are evident in the NRC rules under the AEA and the EPA rules under RCRA. NRC protects the public from radiation hazards by minimizing exposure to radiation by isolating radionuclides until they decay. EPA has implemented RCRA's mandate through a series of carefully prescribed requirements; e.g., the disposal of hazardous waste in lined trenches; monitoring for pollution of ground water; and the operation of leachate collection systems. These different approaches are seen in the following areas:

- packaging and disposal
- sampling
- ground water protection
- liquids in landfills
- post-closure care

RCRA rules are not specifically designed to address radiation hazards. Likewise, the AEA rules are not designed to address chemical hazards.

7. To what extent, if any, are you allowed to defer to the NRC in the regulation of mixed waste, consistent with your responsibilities under RCRA? Are you allowed to defer to NRC regulation where you find that the regulations promulgated by NRC provide a level of protection comparable to that afforded under RCRA? Are you allowed to delegate to NRC your responsibility under RCRA for issuing a permit for any NRC-licensed facility that accepts mixed waste?

Section 1006 of RCRA precludes regulations which are inconsistent with requirements of the AEA. We believe this provision allows EPA to modify or waive RCRA requirements where we find that application of the regulations would increase radiation hazards or otherwise be inconsistent with AEA requirements. Under our current statute, we are not allowed to delegate any authority to NRC.

8. Would you support an approach that would allow you to delegate your permitting responsibility to the NRC, so that a single agency would be in charge of issuing a license or permit under RCRA and the Atomic Energy Act?

Delegation of RCRA permitting authority to NRC, with provisions for NRC to delegate to its implementing States, would allow a facility to satisfy both agencies' requirements by dealing with only one agency. Under this scheme, NRC would then be responsible for implementing the existing RCRA rules at their licensed facilities. This approach would require legislative action.

Under the current regulatory scheme, EPA is continuing to work with NRC to resolve technical differences in our two sets of regulations and to see whether progress can be made on the mixed waste issue on a facility-specific basis.

In addition to mixed waste, the optimal method of disposal of NARM waste also is unresolved. RCRA facilities can legally accept NARM waste; however, since the primary NARM hazard is radioactivity, the logical disposal sites may be NRC-licensed facilities. While there is no law or regulation precluding the disposal of NARM at NRC-licensed facilities, NRC does not have the authority to issue regulations addressing it. Therefore, legislative action to amend the AEA would be required if this approach were taken.

9. Would it make sense, from your standpoint, simply to prohibit the disposal of mixed waste in existing and future sites, so that States and compact regions can get on with the task of locating disposal sites for radioactive waste disposal, particularly if one of the currently-operating low-level waste sites meets the requirements necessary to accept mixed hazardous waste?

Banning mixed waste from disposal at NRC sites would leave only RCRA sites available for disposal. However, RCRA facilities are not designed to address radiation hazards. Disposal of mixed waste must be done in accordance with appropriate NRC requirements, as well as with RCRA requirements. While banning disposal from existing sites may ultimately focus attention on the siting of future facilities under the State compacts, in the interim, it would leave mixed waste with no available disposal alternatives. Banning disposal of mixed waste from future sites would extend this situation, unless and until RCRA sites were found to meet appropriate NRC requirements, including license requirements.

10. As I understand it, one of the biggest contributors to the mixed waste volume, scintillation vials -- which account for most of the mixed waste being generated -- are now no longer being accepted for disposal at any of the operating low-level waste sites. What is happening to these vials?

Generators of liquid scintillation vials have a very narrow number of options from which to select a disposal firm, because there are very few companies that currently handle their disposal. NRC's three operating low-level radioactive waste disposal sites have decided not to accept mixed waste, as currently defined. Quadrex HPS Inc. operates a facility in Gainesville, Florida, which processes these vials to reclaim solvent for reuse. We understand that Quadrex currently decontaminates approximately 70% of all the scintillation vials generated in the United States.

11. To what extent does our experience with scintillation vials, and the current prohibition on their disposal, suggest that a prohibition on the disposal of mixed waste might actually have a positive effect of encouraging other treatment and management options? And to the extent that this might reasonably be expected to occur for the other mixed wastes, would not a prohibition have the healthy effect of forcing these other generators of mixed waste to find some other method of treating or managing their wastes?

The Brookhaven study defined three categories of low-level radioactive waste regulated by NRC that are subject to regulation under RCRA. Although an alternate method for management of liquid scintillation vials is available,

methods of treating the other two categories are not readily available. For wastes containing lead shielding and containers and wastes containing chromium, the separation, elimination or neutralization of hazardous components from a radioactive component would be difficult, if not impossible, to accomplish in most cases. For lead shields, in some cases the volume of the mixed radioactive and hazardous component could be reduced by stripping off the outside layer of material. Yet this material remains a mixed waste. In the case of chromium wastes, there may be a process whereby nonhazardous material is substituted in cooling water, but this has not been explored in great detail. Besides being difficult and costly to accomplish, the process may pose a risk to human health.

13. If no changes are made legislatively and if, as it appears, the existing sites do not meet the requirements necessary to accept mixed waste for disposal, are we essentially faced today with a situation where all of this mixed waste is "orphan waste"?

If no changes are made legislatively, mixed waste will continue to be disposed of at NRC sites. These sites are subject to AEA and RCRA jurisdiction and, therefore, must meet the requirements of both statutes and their implementing regulations.

14. Please comment on the Department of Energy's "byproduct rulemaking." Do you support this approach? What impact would the rulemaking, if finalized, have on EPA's responsibilities under RCRA?

EPA commented on DOE's proposal stating that a rule defining "byproduct material" was not necessary. The facility waste stream studies should be the starting point for facility-specific EPA-DOE discussions to determine what is covered by RCRA and what is not. Mixed waste will continue to be regulated under RCRA, regardless of whether the byproduct rule is promulgated. The proposed definition could, however, affect what is considered "mixed waste".

15. In the absence of any legislative clarification, would you be required to apply RCRA to the disposal of mixed waste in an NRC-licensed low-level radioactive waste disposal facility?

Yes.

16. If so, what specific regulatory requirements would apply, are those regulatory requirements in place today and, if not, when will they be in place?

These sites are currently subject to the RCRA regulations in 40 CFR Parts 260-266 and 270. EPA's response to the 1984 Hazardous and Solid Waste Amendments will require a

number of major modifications (e.g., location standards, air standards and new waste listings and characteristics) to the RCRA standards over the next few years. It is true that the RCRA regulatory program is dynamic with requirements that change periodically. However, this situation is not unique to the RCRA program. Indeed, the current NRC regulatory program is not static and involves change from time to time.

17. In your testimony, you identify two possible legislative fixes for the mixed waste problem: (A) "separate jurisdiction based on primary concern"; and (B) "delegation of authority". In addition, you appear to suggest that a third option would be for Congress to give EPA clear authority to modify its RCRA standards for mixed waste. Which, if any of these approaches does EPA endorse?

As indicated in the response to question #8, we believe that delegation of RCRA permitting and enforcement authority to NRC would solve the existing dual permitting problem. Nevertheless, EPA and NRC are continuing to work together to resolve technical and other issues even without legislation which would cover all NRC-licensed facilities.

18. Does EPA intend to regulate NARM under RCRA, if this material is disposed of at NRC-licensed low-level waste disposal sites?

One option EPA has considered to address NARM waste is to list NARM as a hazardous waste under RCRA and to develop special management standards for its disposal. However, the primary hazard from NARM waste stems from its radioactivity; thus, some of the current RCRA rules, which were designed for protection from chemical hazards, might be inappropriate. The 1984 Amendments also established statutory minimum technical requirements for land disposal facilities (e.g., double liners) which EPA generally does not have the authority to waive. (RCRA Section 1006, which requires RCRA to defer where it would be inconsistent with the AEA, would not apply because NARM is not covered under the AEA.)

Assuming, however, that EPA did list NARM waste, the logical disposal sites for these wastes would be NRC-licensed facilities, since the primary hazard is radioactivity. These facilities would require permits from both NRC and EPA.

RESPONSES TO SENATOR ROBERT T. STAFFORD

1. Do management and treatment of mixed waste represent a safe long-term option as opposed to land disposal of those wastes? What is the safest way to deal with these wastes?

Management and treatment of liquid scintillation vials is a safe long-term option. However, no treatment technology is readily available for lead and chromium mixed waste. At present, the safest way to deal with these wastes is to analyze waste streams on a case-by-case basis; make a determination on the radiation and chemical hazards of each waste stream; and ensure disposal is conducted in a manner that appropriately addresses the identified hazards in accordance with EPA and NRC requirements.

2. Are there any impediments to future disposal or management of mixed waste in a safe manner? If so, what are they?

The potential for a prohibition on disposal of mixed wastes at NRC facilities or a lack of sufficient disposal capacity at NRC facilities (because of closing of existing sites and failure to identify new sites under State compacts) could affect the safe disposal of mixed wastes. RCRA facilities are not designed to protect from risks posed by radiation. In addition, NARM wastes are currently not regulated under RCRA or the AEA; thus, their disposal is uncertain.

3. Would you please describe how EPA is implementing the application of RCRA to hazardous waste mixed with radioactive waste, other than byproduct material, at DOE facilities? Are there any major unresolved issues?

Mixed wastes currently are not subject to RCRA jurisdiction in authorized States. No States have yet been authorized for mixed wastes. The major unresolved issue between EPA and DOE is the question of variances in instances of inconsistency between RCRA and AEA standards or where release of information would be contrary to our national security interests. EPA is developing regulations to address this issue.

4. Please comment on DOE's proposed rulemaking defining byproduct material.

EPA commented on DOE's proposal stating that a rule defining "byproduct material" was not necessary, and that the facility waste stream studies should be the basis for a RCRA/DOE mixed waste program. In effect, we believe that the two agencies can resolve the issues by determining, on a site-specific basis, what is covered by RCRA and what is not. Mixed waste will continue to

be regulated under RCRA, regardless of whether or not the byproduct rule is promulgated. The proposed definition could, however, affect what is considered "mixed waste".

5. How is DOE now treating the hazardous component of what DOE proposes to call byproduct material? How does this compare with the protection that would be afforded under RCRA?

These determinations have not been made. The majority of States are authorized to operate hazardous waste control programs in lieu of the Federal EPA program. Mixed waste, however, is currently beyond the scope of the authorized State and is regulated only under State law. Thus, EPA does not have this information.

RESPONSES TO SENATOR FRANK R. LAUTENBERG

1. Are the current incineration technologies sufficient to ensure adequate protection of human health and the environment? If improvements are needed, at what stage(s) is (are) improvements needed; e.g., development, design, implementation or others?

Incineration technology easily destroys organics to safe levels: 99.99% - 99.9999% destruction. NRC has reviewed the safety and environmental impacts of a number of incinerators used for treatment of low-level radioactive waste and found them to be acceptable.

2. How are incinerators of mixed wastes regulated, under what statutes and/or regulations, as disposal and/or treatment facilities? What permits and/or licenses are required?

Any facility which treats (including incinerates), stores or disposes of hazardous waste is subject to the requirements of RCRA and its regulations in 40 CFR Parts 260-266 and 270. Incinerators are also regulated by EPA under the Clean Air Act. Facilities handling mixed wastes are, in addition, subject to regulation under the Atomic Energy Act. Permits are required under all of these statutes.

3. What are the major toxic and chemical effluents? What is or should be monitored, what techniques are employed and how frequently is monitoring performed? What are the maximal amounts allowed in the effluents? What are the major contaminants in the ash?

A trial burn is required to demonstrate that 99.99% - 99.9999% of toxic organic constituents in waste are destroyed. The gas is continuosly monitored for carbon monoxide and oxygen, and combustion temperature is continuously monitored to ensure efficient destruction after the trial burn. Organic content of ash should be well under one part per million.

4. Are more incinerators needed to effectively process liquid scintillation vials (LSV) nationwide? How much LSV mixed waste is being produced in New Jersey each year? Who are the major generators? Where is this LSV waste going?

Additional capacity may not be needed, but it would probably be desirable to have more incinerators located closer to the major waste generation areas. NRC licensees are not required to report generation rates to NRC, so that information is not available. Hospitals and research laboratories are the major generators. Most (approximately 70%) of the vials go to the Quadrex facility in Gainesville, Florida, with the remainder being stored or incinerated on-site or disposed in commercial radioactive disposal facilities.

5. How has the LSV industry, vials, fluid and scintillators adjusted to the need to minimize this waste stream? How have industry's response reduced the volume of the LSV waste so far?

The manufacturing industry is producing the mini-vial, which is 5cc as opposed to the standard 20cc vial. In addition, some companies have developed a water-based solvent which is less problematic than organic solvents. Neither EPA nor NRC has information related to the reduction in volume of LSV waste.

6. Are the siting requirements for LLRW and RCRA facilities the same? If the two sets of requirements are different, how are they different? If the differences are unknown, who is responsible for knowing? If there are differences, are these differences in conflict or are they compatible? If they are in conflict, who is responsible, what is needed to make them compatible?

EPA's location standards currently cover only floodplains and seismic areas. However, the 1984 Amendments require EPA to develop new location standards. These standards have not yet been developed.

7. If the siting requirements for the LLRW and RCRA facilities are the same, would additional requirements for design delay a siting determination? How late could the design for mixed wastes at LLRW sites be developed for compatible LLRW and the four main mixed waste streams be determined without delaying the construction of the LLRW facilities?

As EPA has not yet developed the additional regulations required by the 1984 Amendments, we cannot speculate as to whether they would cause a delay in siting LLRW facilities.

8. How long would it take NRC to develop design criteria for mixed wastes at LLRW facilities? What design precautions for the disposal of xylene, toluene, POP, POPOP, Pb, Cr, and Hg at LLRW sites? What other precautions are needed for the packaging, transportation and disposal of these particular wastes at LLRW sites?

The question of how long it would take for NRC to develop regulations should properly be posed to NRC. Design precautions, as well as packaging, transportation and disposal requirements dealing with chemical hazards are currently contained in the RCRA regulations.

TESTIMONY BEFORE THE

SUBCOMMITTEE ON NUCLEAR REGULATION
AND THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
COMMITTEE ON ENVIRONMENT & PUBLIC WORKS
UNITED STATES SENATE

PRESENTED BY

JOHN G. DAVIS, DIRECTOR
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
U.S. NUCLEAR REGULATORY COMMISSION

CONCERNING

MIXED WASTE

SUBMITTED: MARCH 25, 1986

JOHN G. DAVIS, DIRECTOR

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

U.S. NUCLEAR REGULATORY COMMISSION

MR. CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE,

I AM JOHN G. DAVIS, DIRECTOR OF NRC'S OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS. REGULATION OF LOW-LEVEL RADIOACTIVE WASTE DISPOSAL IS ONE OF MY RESPONSIBILITIES AS DIRECTOR OF THAT OFFICE.

I AM APPEARING BEFORE YOU TODAY TO DISCUSS A TOPIC THAT WAS NOT RESOLVED BY THE LOW-LEVEL RADIOACTIVE WASTE POLICY AMENDMENTS ACT OF 1985 (LLRWPAA HEREAFTER REFERRED TO AS THE LOW-LEVEL WASTE AMENDMENTS ACT). THAT TOPIC IS, THE DISPOSAL OF LOW-LEVEL RADIOACTIVE "MIXED WASTE." "MIXED WASTES" ARE THOSE LOW-LEVEL RADIOACTIVE WASTES THAT ALSO CONTAIN CHEMICAL CONSTITUENTS THAT WOULD, BY THEMSELVES, BE CLASSIFIED AS HAZARDOUS UNDER EPA RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) REGULATIONS. AS NRC STAFF TESTIFIED LAST FALL DURING CONSIDERATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT, OUR CONCERNS OVER MIXED WASTES CENTERED ON THE UNCERTAINTIES SUCH WASTES COULD HAVE ON ASSURING THAT THE

STATES WOULD BE ABLE TO PROCEED WITH PROVIDING NEEDED LOW-LEVEL WASTE CAPACITY IN A STABLE REGULATORY ENVIRONMENT.

MY COMMENTS REPRESENT NRC STAFF TECHNICAL VIEWS. THE NRC AND EPA STAFFS CONTINUE TO WORK TOGETHER TO IDENTIFY, UNDERSTAND, AND RESOLVE THE ISSUES OF CONCERN AND THE NRC STAFF HAS NOT YET PRESENTED POLICY OPTIONS TO THE COMMISSION. THEREFORE, THE COMMISSION HAS NOT HAD AN OPPORTUNITY TO FULLY ADDRESS THE POLICY IMPLICATIONS OF THIS ISSUE.

ALTHOUGH NRC STAFF HAS NOT CONDUCTED A COMPREHENSIVE STUDY OF ALL 20,000 OF THE ATOMIC ENERGY ACT LICENSEES, THE AGENCY HAS SPONSORED SEVERAL STUDIES, COORDINATED WITH EPA TECHNICAL STAFF, IN AN EFFORT TO BETTER UNDERSTAND THE NATURE AND MAGNITUDE OF LOW LEVEL MIXED WASTES CURRENTLY BEING GENERATED. BASED ON THE INFORMATION DERIVED FROM THESE STUDIES, NRC STAFF MADE A DETERMINATION THAT IT IS NOT NECESSARY TO SURVEY THE ENTIRE GROUP OF LICENSEES.

IN ONE STUDY (NUREG/CR-4406), MIXED WASTES CURRENTLY BEING GENERATED WERE IDENTIFIED THROUGH A SURVEY OF A SELECTED REPRESENTATIVE GROUP OF WASTE GENERATORS. RESULTS OF THE SURVEY INDICATE THAT AT PRESENT SCINTILLATION MEDIA AND OTHER LOW-LEVEL WASTES CONTAINING ORGANIC SOLVENTS COMPRISE THE LARGEST CATEGORY

OF MIXED WASTES. LEAD USED FOR SHIELDING, SCINTILLATION WASTES FROM BIOMEDICAL SOURCES, ORGANIC SOLVENTS FROM CLEANING OPERATIONS (OFTEN IN THE FORM OF RAGS), CHROMIUM CONTAINING WASTES FROM REACTORS, AND MISCELLANEOUS WASTES THAT MAY BE UNIQUE TO A SPECIFIC GENERATOR (E.G., MERCURY CONTAMINATED TRASH) WERE ALSO IDENTIFIED AS POTENTIAL MIXED WASTES. THE STUDY SUGGESTS THAT CURRENTLY GENERATED MIXED WASTES REPRESENTS A SMALL VOLUME WHEN COMPARED TO ALL WASTES, EITHER RADIOACTIVE OR HAZARDOUS. MIXED WASTES WERE ESTIMATED TO MAKE UP LESS THAN 3% (APPROXIMATELY 80,000 FT^3) OF ALL RADIOACTIVE WASTES SHIPPED FOR DISPOSAL IN 1984 (2,600,000 FT^3), AND LESS THAN ABOUT 1/10TH OF A PERCENT OF ALL HAZARDOUS WASTES DISPOSED FOR THAT YEAR.

A SECOND STUDY, (NUREG/CR-4450), REPORTS ON CURRENT PRACTICES AND MANAGEMENT OPTIONS AVAILABLE TO HANDLE THE MIXED WASTES. THE MANAGEMENT OPTIONS INCLUDED INCINERATION, DECONTAMINATION WITH POTENTIAL FOR RECYCLE, SOLIDIFICATION BY CHEMICAL COMBINATION, AND ENHANCED CONTAINMENT. THESE MANAGEMENT OPTIONS ARE APPLICABLE TO MANY CATEGORIES OF MIXED WASTES. EXISTING MANAGEMENT OPTIONS CAN BE USED TO REDUCE VOLUMES OF MIXED WASTE REQUIRING DISPOSAL TO LEVELS BELOW THOSE DOCUMENTED IN THE SURVEY.

THE PROVISIONS IN THE LOW-LEVEL WASTE AMENDMENTS ACT, REQUIRE VOLUME REDUCTION AND DIRECT NRC TO CONSIDER EXEMPTING WASTES WHICH

ARE BELOW REGULATORY CONCERN. THIS COULD ALSO RESULT IN REDUCED VOLUMES OF MIXED WASTE REQUIRING DISPOSAL AT LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITES. FOR EXAMPLE, SUCH REDUCTION HAS ALREADY OCCURRED AS A RESULT OF NRC'S MARCH, 1981, RULE ESTABLISHING "DE MINIMUS" LEVELS, OR LEVELS BELOW REGULATORY CONCERN, FOR CERTAIN SCINTILLATION LIQUIDS.

NRC STAFF CANNOT OVERLOOK THE POSSIBILITY THAT THE QUANTITY OF MIXED WASTE REQUIRING DISPOSAL MAY INCREASE IN THE FUTURE. AN INCREASE COULD OCCUR THROUGH A FUTURE DECISION BY EPA TO ADD ADDITIONAL SUBSTANCES TO ITS LIST OF HAZARDOUS WASTES, SUCH AS WASTE OILS; OR AS A CONSEQUENCE OF DECONTAMINATION AND DECOMMISSIONING OPERATIONS OF NUCLEAR FACILITIES CREATING ADDITIONAL MIXED WASTE STREAMS.

TO FURTHER ENHANCE THE AGENCIES REGULATORY ABILITY, THE NRC STAFF ALSO INITIATED INDEPENDENT SAMPLING OF GROUNDWATER MONITORING WELLS AT TWO REPRESENTATIVE LLW DISPOSAL SITES IN HUMID CLIMATES. CONSTITUENTS ASSOCIATED WITH THE LEAD, THE CHROMIUM AND THE SCINTILLATION WASTES WERE NOT FOUND ABOVE DETECTION LIMITS. HOWEVER, SEVERAL HAZARDOUS ORGANIC CONSTITUENTS WERE DETECTED THAT HAD MIGRATED FROM THE LLW TRENCHES. NRC STAFF HAS ASSESSED THESE RELEASES AND DETERMINED THAT THE RELEASES HAVE NOT RESULTED IN ANY EXPOSURE TO THE PUBLIC.

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STAFF HAS ALSO EVALUATED INFORMATION PREVIOUSLY COLLECTED FROM THE FOUR OTHER LLW DISPOSAL SITES. TWO OF THOSE SITES WERE LOCATED IN ARID CLIMATES AND LIMITED DATA EVALUATED INDICATED THAT NO MIGRATION OF HAZARDOUS SUBSTANCES HAD BEEN DETECTED. HOWEVER, LIMITED MIGRATION HAD BEEN DETECTED WITHIN THE OTHER TWO SITES. THE FINAL STAFF REPORT DOCUMENTING THESE GROUNDWATER STUDIES WILL BE AVAILABLE IN APPROXIMATELY TWO MONTHS.

PLANNED RESPONSE TO THE INFORMATION COLLECTED AND THE STAFF ANALYSES INCLUDES MODIFICATIONS OF THE MONITORING PROGRAMS AT CURRENTLY OPERATING SITES. STAFF BELIEVES THAT FUTURE HEALTH IMPACTS AT THE SIX EXISTING SITES ARE UNLIKELY.

IN PARALLEL WITH NRC'S STUDIES ON MIXED WASTE, NRC AND EPA STAFFS HAVE BEEN MEETING TO DETERMINE THE BEST WAY TO CONTINUE TO ASSURE PROTECTION OF THE PUBLIC HEALTH AND SAFETY AND THE ENVIRONMENT WHILE AT THE SAME TIME SEEKING TO ELIMINATE UNNECESSARY DUAL AND CONFLICTING REGULATION OF LOW-LEVEL RADIOACTIVE MIXED WASTE DISPOSAL.

DURING HEARINGS RELATED TO PASSAGE OF THE LOW-LEVEL WASTE AMENDMENTS ACT, BOTH THE NRC STAFF AND THE EPA TESTIFIED THAT ACCEPTABLE TO BOTH AGENCIES, AS A RESOLUTION OF THE DUAL JURISDICTION ISSUE, WAS THE DELEGATION OF RCRA AUTHORITY TO NRC FOR MIXED WASTES. LEGISLATION WAS DEEMED NECESSARY, BECAUSE THE

EXISTING RCRA STATUTE ONLY ALLOWS EPA TO DELEGATE ITS RCRA AUTHORITIES TO STATES, BUT NOT TO OTHER FEDERAL AGENCIES. HOWEVER, NRC'S POSITION AT THAT TIME WAS BASED ON AN INCOMPLETE UNDERSTANDING OF THE FULL IMPACT AND OF THE STATUS OF EPA'S IMPLEMENTATION OF THE RCRA AMENDMENTS ACT OF 1984. AS PART OF OUR CONTINUING INTERAGENCY CONSULTATIONS, NRC STAFF HAS COME TO APPRECIATE THE FOLLOWING IMPACTS OF THE RCRA AMENDMENT REQUIREMENTS THAT WILL AFFECT TWO AREAS OF IMPORTANCE TO THE IMPLEMENTATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT: (1) IMPACTS ON APPLYING RCRA DIRECTLY TO CURRENTLY OPERATING SITES; AND (2) RCRA REGULATORY UNCERTAINTIES WHICH WILL IMPACT IMPLEMENTATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT MILESTONES FOR OBTAINING NEW LOW-LEVEL WASTE DISPOSAL SITES.

NRC STAFF UNDERSTANDS THAT SECTION 206, THE "CONTINUING RELEASE" SECTION OF THE 1984 RCRA AMENDMENTS ACT, IF APPLIED TO THE THREE CURRENTLY OPERATING LLW DISPOSAL SITES, COULD COMPROMISE THEIR CONTINUING AVAILABILITY FOR MIXED WASTE. THIS SECTION PROVIDES THAT IF MIGRATION OF ANY QUANTITY OF RCRA-REGULATED SUBSTANCES IS DETECTED OUTSIDE ANY DISPOSAL UNIT (ALTHOUGH STILL ON-SITE), CORRECTIVE ACTION IS REQUIRED. THIS APPLIES TO ALL RELEASES OF HAZARDOUS WASTE OR CONSTITUENTS FROM ANY SOLID WASTE MANAGEMENT UNIT AT A TREATMENT, STORAGE, OR DISPOSAL FACILITY SEEKING A PERMIT REGARDLESS OF THE TIME AT WHICH WASTE WAS PLACED IN SUCH A

UNIT. IT IS NRC STAFF UNDERSTANDING THAT IF THERE IS NO EXISTING OR PENDING PERMIT TO RECEIVE RCRA REGULATED SUBSTANCES, THE SITES COULD CONTINUE TO RECEIVE RADIOACTIVE BUT NOT MIXED WASTE.

EXISTING MIXED WASTES FOR WHICH AVAILABLE MANAGEMENT OPTIONS CAN NOT REMOVE OR CONTROL THE CHEMICALLY HAZARDOUS CONSTITUENTS MAY NOT BE AMENABLE TO DISPOSAL UNDER THE CURRENT STATUTORY FRAMEWORK. THE THREE OPERATING LLW DISPOSAL SITES HAVE DECIDED NOT TO ACCEPT AS CURRENTLY DEFINED MIXED WASTE AT THIS TIME. OPERATORS OF CHEMICALLY HAZARDOUS WASTE SITES CAN NOT ACCEPT MIXED WASTES UNLESS LICENSED TO ACCEPT RADIOACTIVE MATERIAL REGULATED BY NRC; NOR CAN THE OPERATOR OF A PERMANENT CHEMICAL DISPOSAL SITE BE REQUIRED TO ACCEPT ANY WASTE THEY DO NOT DESIRE TO ACCEPT. LEGISLATION IS, THEREFORE, NECESSARY TO ADDRESS THE DISPOSAL OF EXISTING AS WELL AS FUTURE MIXED WASTES.

MOREOVER, NRC STAFF UNDERSTANDS THAT NOT ALL LEGISLATIVELY MANDATED RCRA IMPLEMENTING REGULATIONS ARE IN PLACE AT THIS TIME. FOR EXAMPLE, SITING AND DESIGN CRITERIA FOR RCRA FACILITIES ARE YET TO BE DEVELOPED. FURTHER, STAFF BELIEVES THAT ISSUANCE OF THESE IMPLEMENTING REGULATIONS WILL NOT OCCUR WITHIN THE TIMEFRAMES ESTABLISHED BY THE CONGRESS FOR THE STATES TO SITE AND DEVELOP LOW-LEVEL WASTE FACILITIES.

NRC IS CONCERNED THAT UNCERTAINTIES RESULTING FROM THE EVOLVING NATURE OF THE RCRA REGULATIONS COULD THREATEN THE TIMELY IMPLEMENTATION OF MILESTONES IN THE AMENDMENTS ACT. IF STATES ARE REQUIRED TO DESIGN THEIR LLW FACILITIES TO MEET RCRA FOR THE DISPOSAL OF MIXED WASTE, THE UNCERTAINTY SURROUNDING THE RCRA REQUIREMENTS COULD DELAY THE CONGRESSIONALLY MANDATED DEVELOPMENT OF NEW LICENSED LLW DISPOSAL CAPACITY.

NRC STAFF ALSO UNDERSTANDS THAT EPA MAY BE ADDING NEW SUBSTANCES TO ITS LIST OF REGULATED HAZARDOUS SUBSTANCES AS NECESSARY, AND THE FULL PROVISIONS OF RCRA WOULD BE APPLIED TO FUTURE AS WELL AS PAST DISPOSAL ACTIONS. FOR INSTANCE, EPA HAS PROPOSED THAT WASTE OILS SHOULD BE INCLUDED ON ITS LIST OF REGULATED HAZARDOUS SUBSTANCES. IF ADOPTED, THIS ACTION WOULD LIKELY DOUBLE THE PERCENTAGE OF LLW, CONSIDERED TO BE MIXED WASTE. THIS ADDS FURTHER UNCERTAINTY TO TIMELY IMPLEMENTATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT.

THESE ARE SOME OF THE SALIENT POINTS DEALING WITH THE IMPACT OF RCRA ON THE IMPLEMENTATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT, THAT ARE NOW APPARENT TO US. NRC STAFF HAVE DISCUSSED THESE POINTS WITH EPA STAFF AND THEY ARE IN AGREEMENT WITH NRC STAFF'S ANALYSIS OF THE POTENTIAL IMPLICATIONS. SINCE THESE DISCUSSIONS

ARE OF A CONTINUING NATURE, NOT ALL POTENTIAL CONCERNS OR ISSUES HAVE BEEN ADDRESSED AT THIS TIME.

THE AFOREMENTIONED MIXED WASTE REGULATORY UNCERTAINTY HAS LED NRC STAFF TO CONCLUDE THAT DELEGATION OF RCRA AUTHORITY TO THE NRC IN AND OF ITSELF MAY NOT PROVIDE A COMPLETE SOLUTION TO THE MIXED WASTE ISSUE. THUS, NRC STAFF NO LONGER SUPPORTS ANY OF THE EARLIER PROPOSED LEGISLATIVE APPROACHES, WHILE SEEKING TO REACH A TECHNICAL SOLUTION IN COORDINATION WITH EPA.

USING THE INFORMATION PROVIDED BY THE RECENTLY COMPLETED STUDIES AND IN COORDINATION WITH EPA STAFF, NRC STAFF IS IN THE PROCESS OF CONSIDERING OPTIONS AVAILABLE FOR REGULATING THE DISPOSAL OF THESE MIXED WASTES. THIS CONSIDERATION HAS NOT YET BEEN COMPLETED. THE NRC STAFF GOAL IS TO ASSURE THAT THE ACTIONS REQUIRED UNDER THE LOW-LEVEL WASTE AMENDMENTS ACT CAN PROCEED WHILE A LEGISLATIVE SOLUTION, IS DEVELOPED FOR MIXED WASTE.

WE SUGGEST THAT WHATEVER SPECIFIC ACTION THE CONGRESS DOES CHOOSE TO TAKE SHOULD: A) MINIMIZE THE GENERATION OF MIXED WASTES, B) REMOVE ANY REGULATORY UNCERTAINTY WHICH STANDS TO IMPEDE THE TIMELY IMPLEMENTATION OF THE LOW-LEVEL WASTE AMENDMENTS ACT, AND C) RESOLVE QUESTIONS OF MULTIPLE AND/OR CONFLICTING JURISDICTIONS.

TESTIMONY OF

J. J. SCOVILLE, PRESIDENT

US ECOLOGY, INC.

BEFORE THE

ENVIRONMENTAL POLLUTION SUBCOMMITTEE

AND

NUCLEAR REGULATION SUBCOMMITTEE

OF THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

WASHINGTON, D. C.

MARCH 25, 1986

US Ecology, Inc.

9200 Shelbyville Road

Suite 300

Louisville, Kentucky 40222

Mr. Chairman and Members of the Committee:

I am Jerry Scoville, President of US Ecology, Inc., a company that operates two of the nation's three commercial low-level radioactive waste disposal sites, one near Beatty, Nevada, some 100 miles northwest of Las Vegas in the Amargosa Desert, the other on the Department of Energy's Hanford Reservation in the state of Washington.

Our company has over 25 years of experience in managing low-level radioactive waste and has been closely involved in the regulatory processes governing this type of material.

We have been asked specifically to comment today on the dual regulation of low-level radioactive waste disposal facilities by both the NRC and the EPA, otherwise known as the "mixed waste" issue -- I am pleased to do so.

It is our view that the dual regulation of low-level radioactive waste disposal facilities by the NRC and the EPA threatens the regional compact system for it presents potentially unresolvable difficulties for present and future site operators, the medical profession, and industrial and utility generators as well. In my testimony last year I raised these same concerns. They are equally valid today.

Because of the extensive nature of the questions posed by the committee, which were not received by me until last Friday, and my short time allotment, I will try today to briefly address each of the eight areas requested and the company will provide fully responsive answers in the next week to complete my testimony.

Question 1

The NRC report on mixed wastes, generally known as the "Brookhaven Report," is by its own admission a less than accurate portrayal of the mixed waste issue. The analysis, based upon surveys of generators by waste class, contained a disproportionately small number of responses from medical institutions. It was also stated in the analysis that many of those

responding to the survey were probably unfamiliar with the RCRA regulations about which they were responding. At the heart of this problem is the issue of, what is a mixed waste? Without a definite answer to this root issue, the Brookhaven Report and any projection I could make with respect to the amount of mixed waste is pure conjecture. My fear is that without a clear and concise federal definition in the near future, this same type of conjecturing will be made by each state regulatory agency which will lead to a less than uniform enforcement of the law and paralysis of those industries which rely on nuclear products. Congress, in enacting the Low-Level Radioactive Waste Amendments of 1985 and the compacts, realized the importance of a uniform definition of low-level radioactive waste and provided one in the Act. Such a definition is no less important for mixed wastes if the compacts are to succeed.

Question 2

The definition of "mixed waste" is the determining factor in establishing the percentage of mixed waste out of the total. The Brookhaven Report estimates that the total is less than 3% for medical wastes, up to 20% if you include lead shielding and other materials. If you use another indicator, basing it on the receipt of wastes at the sites which we operate and the number of wastes that have been identified by their generators as hazardous or mixed wastes under RCRA, the answer is zero. US Ecology has never received a RCRA manifest with a shipment of low-level radioactive wastes and therefore could conclude that no such waste has ever been shipped to one of our facilities. If generators have been shipping such wastes to our facility, then they are in violation of both civil and criminal standards set forth for generators under RCRA. In this case, EPA has a serious enforcement problem because of the number of institutions such as Michael Reese Hospital and the Mayo Clinic that have been shipping such unmanifested wastes to our facilities for years. There has never been any indication of enforcement action against these generators by the EPA, but if US Ecology as a disposal operation is subject to regulation and enforcement activity, clearly the generators of those materials are as well.

Question 3

Of the wastes listed in the Brookhaven Report, US Ecology has ceased the receipt of all scintillation liquids and vials containing organic

chemicals. We have no company prohibition from receiving the rest of these type wastes. It was our understanding that the scintillation wastes which we ceased receiving were potentially RCRA wastes and were so informed by the state and federal regulators. No other materials have been specifically identified as RCRA regulated nor have they been manifested as such.

Question 4

It is my understanding that most of the materials that we stopped receiving are being sent to a facility in Florida where the vials are crushed and the scintillation fluid is then used as a fuel in a cement kiln. The operator performing this work has a radioactive materials license but does not have a RCRA permit for the treatment of these materials. There are one or two other small facilities like this around the country, one of which dilutes the materials before deepwelling. To our knowledge, no enforcement or regulatory action dealing with licensing has ever been taken by EPA or NRC against these facilities.

US Ecology has a firm commitment to build a LLRW incinerator and has pursued a license for a facility in the state of North Carolina for approximately two years. We have been unsuccessful, in part, to this point because of the uncertainties surrounding mixed wastes and the question of who will regulate the facility.

Question 5

There are a large number of conflicts between the NRC regulations and the EPA regulations that reflect the differing approaches to the same goal--protection of the public, and that must include employees, health and safety. RCRA requires a verification of wastes at point of origin and at the facility prior to disposal. This makes sense for a chemical waste, but can only lead to unnecessary and hazardous exposures to workers at radioactive facilities. While RCRA requires the pumping of leachate, NRC regulations discourage it because of the greater spread of contamination that would be caused by this practice. My written statement and prior testimony before Congress contains more specificity regarding the significant conflicts between the two sets of regulations. However, I would point out here one major philosophical difference--RCRA is designed to eliminate shallow land burial

whereas the LLRW Policy Amendments Act of 1985 relies almost exclusively on this method in meeting the stringent deadlines for new site development.

Question 6 & 7

Under the present set of circumstances, it appears unlikely, at best, that the mixed waste issue can be expeditiously resolved. I base this on the fact that in 1980 US Ecology asked EPA for an interpretation of the potential dual regulation of this material. We asked again in 1983 and in 1985, and have yet to receive any definite response. The agencies are either unwilling or unable to address this issue through the administrative process. I therefore see little hope for a resolution of this issue without new legislation mandating that the NRC be vested with full authority for accomplishing this reconcilliation and is designated as the sole licensing authority. Such a designation should contain a legislatively mandated performance schedule.

Question 8

US Ecology generally supports the procedural approach of Section 11 of Senate Bill 1578 to resolve conflicts between EPA and the NRC. The company feels very strongly that the resolution of this issue must be accomplished at the federal level. Unless and until there is a comprehensive national plan for the disposal of mixed wastes, new site development and construction could be delayed or totally frustrated.

Under the circumstances it is our recommendation that:

- the NRC be vested with the authority to regulate all radioactive wastes including naturally occurring and accelerator produced wastes;

- the NRC be vested with permitting authority to regulate "mixed wastes," i.e. those low-level radioactive wastes that contain a mixture of radioactive and hazardous waste;

- a national scheme for the regulation of "mixed wastes" be developed so as to provide uniformity among the several states.

I believe that this entire debate is a matter of form over substance. At no time have I heard that these small amounts of potential RCRA wastes are posing a threat or hazard to public health and safety. I do not believe that they are. Let the EPA, which has characterized itself as under budgeted and overworked, address those problems that actually present a public health threat. The present system of NRC regulation has more than adequately protected the public health and safety in this LLRW commercial disposal area for almost 25 years and should be continued. This is not an instance where form should be allowed to rule and where substance should be made to suffer.

SUPPLEMENT TO THE TESTIMONY OF

J. J. SCOVILLE, PRESIDENT

US ECOLOGY, INC.

BEFORE THE

ENVIRONMENTAL POLLUTION SUBCOMMITTEE

AND

NUCLEAR REGULATION SUBCOMMITTEE

OF THE

SENATE COMMITTEES ON ENVIRONMENT AND PUBLIC WORKS

WASHINGTON, D. C.

APRIL 10, 1986

US Ecology, Inc.
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Question 1. In December of 1985, the NRC published a report entitled "An Analysis of Low-Level Wastes: Review of Hazardous Regulations and Identification of Radioactive Mixed Wastes" (NUREG/CR-4406). Is this report, in your view, a comprehensive and accurate summary of all low-level radioactive mixed wastes that are currently being generated? Is the report a complete and accurate depiction of the volumes and types of such wastes, as well as the sources of generation? If not, what additional wastes would you classify as mixed wastes? Who generates these wastes? In what volumes? What hazardous substances are contained in these additional wastes that are subject to regulation under RCRA?

Answer: As set forth in our testimony on March 25, 1986, before the Environmental Pollution Subcommittee and Nuclear Regulation Subcommittee of the Senate Committees on Environment and Public Works, US Ecology, Inc. believes that the Brookhaven Report is a less than accurate portrayal of the mixed waste issue. By the Report's own admission, the analysis, which was based upon surveys of generators by waste class, contains a disproportionately small number of responses from medical institutions. Another apparent flaw in the survey procedure was the unfamiliarity of the persons responding to the questionnaire with the RCRA regulations. At this point in time, neither the NRC nor the EPA has determined what is a mixed waste. With the inability of these two agencies to make such a determination, it is impossible to believe that the persons responding to these questionnaires had any better idea and therefore the responses certainly must be suspect.

In addition, the persons responding to these questions were identified from records kept at the low-level waste disposal facilities and other repositories where low-level radioactive waste records were mentioned. This is further evidence that the persons who responded to the questions, while familiar with the radioactive hazard of the waste, may have had no reason at all to be familiar with RCRA regulations. This has been substantiated by our experience with the generators who have shipped waste to our facilities.

However, the Brookhaven Report does lead to one significant finding with respect to the issue of the mixed waste "problem," i.e. while the Brookhaven study may not be complete and accurate because of the way it was produced, it does establish that there is a current definable universe of potential mixed waste and that that universe is limited. A much larger, though unknown, volume of RCRA hazardous wastes that are totally uncontrolled are being disposed of daily in municipal landfills under RCRA exemptions. US Ecology is confident that this number is greater by several orders of magnitude than the mixed wastes accepted by US Ecology for disposal at its licensed facility. No one has expressed any concern for this disposal practice. In addition, the exceptionally large volume of uranium mill tailings containing corrosives would seem to present a much larger environmental problem than the small volumes of mixed waste which are incidental to the operation of existing commercial low-level radioactive waste landfills.

Question 2. Of the total annual volume of low-level radioactive waste generated by sources other than the federal government, what percent is mixed waste?

Answer: The definition of mixed waste is the determining factor in establishing the percentage of mixed waste out of the total. The Brookhaven Report estimates that the total is less than 3 percent for medical wastes, up to 20 percent if you include lead shielding and other materials, though the latter figure may have been skewed by a one time shipment of a particular waste. On the other hand, if you use another indicator, basing it on the receipt of wastes at the sites which US Ecology operates and the number of

wastes that have been identified by their generators as hazardous or mixed wastes under RCRA, the answer is zero.

US Ecology has never received a RCRA manifest with a shipment of low-level radioactive waste and therefore one could conclude that no such waste has ever been shipped to one of our facilities. However, if generators have been shipping such wastes to our facility, then they are in apparent violation of both civil and criminal standards set forth for generators under RCRA. Should this be the case, EPA has a serious enforcement problem on its hands because of the number of institutions such as Michael Reese Hospital and the Mayo Clinic that have been shipping such unmanifested wastes to our facilities for years. There has never been any indication of enforcement action against these generators by the EPA.

Because of the situation described above, it is impossible for US Ecology to determine the percent of mixed waste produced in this country. US Ecology has no record or evidence of the amount of waste that has been accepted and disposed of by such commercial entities as Quadrex in Florida, nor of the number of on-site incinerators at medical and research facilities which dispose of their own waste. US Ecology believes that the scintillation vials which it received at its Richland facility in 1985 amounted to approximately 1-1/2 percent of that facility's total volume. In addition, approximately 5 percent of the Richland facility's volume was described by the generators as containing resins. We have no other break down for the other wastes which may have been identified as mixed waste by the Brookhaven Report which we received

at the facility. Also, US Ecology does not know the amount or type of waste remaining in storage at generators' facilities because the generator has determined that the chemical hazard of the waste exceeds the radiological hazard. Such waste is currently excluded by specific license conditions by the respective Agreement States. This type of waste is also excluded from EPA permitted disposal facilities due to its radioactivity.

Question 3. Of the wastes identified in NUREG/CR-4406, which ones are currently being accepted for disposal at the licensed low-level radioactive waste disposal sites operated by US Ecology? Where are these wastes coming from? In what amounts?

Answer: Of the wastes listed in the Brookhaven Report, US Ecology has ceased the receipt of all scintillation liquids and vials containing organic chemicals. It was our understanding that the scintillation wastes which we ceased receiving were potentially RCRA wastes and were so informed by the state and federal regulators. No other materials have been specifically identified as RCRA regulated nor have they been manifested as such. The complexity of making the determination that a waste is a "hazardous waste" per RCRA is illustrated in Attachment A* where US Ecology discusses the various exclusions and tests for making that determination with respect to scintillation vials.

With the exception of resins, it is impossible for US Ecology to determine the amounts of other mixed wastes that have been identified by the Brookhaven Report and which may have been accepted for disposal, inasmuch as the wastes have not been identified by their generators as containing the potentially

*The attachment referred to has been retained in committee files.

RCRA regulated materials listed in the Brookhaven Report, e.g. chromium or mercury. The wastes are generated at those facilities identified in the Brookhaven Report and US Ecology would not dispute those sources of generation as delineated therein. What is manifest from the Brookhaven Report is that before the extent of the mixed waste issue is understood and effectively managed, mixed waste must be defined, and those generators of mixed wastes must be educated.

Question 4. Aside from disposal in a licensed low-level radioactive waste disposal facility, what other options are available for the treatment or management of low-level radioactive mixed wastes? Can any or all of these wastes be effectively incinerated? Is so, which ones? Are there facilities available that provide such a service? Is, where? Can any or all of these wastes be decontaminated, either through chemical, mechanical, or other processes? Is, which ones? Are there facilities available that provide such a service? Is, where? Aside from these options, are there other alternative management or treatment options now available, or likely to be available in the future, that would eliminate or minimize the need to dispose of low-level radioactive mixed wastes in a licensed low-level radioactive waste disposal facility? Can low-level radioactive mixed wastes be treated or managed so that disposal in a licensed low-level radioactive waste disposal facility is not necessary?

Answer. Other than direct disposal at a licensed low-level radioactive waste disposal facility, a limited number of options are available for the treatment or management of low-level radioactive mixed wastes which usually achieve volume reduction. These other potential options include:

a. Filtration - The removal of the hazardous or radioactive constituent by ultra-filtration. However, this process produces a used filter containing these same constituents which must be disposed of at a licensed landfill. The filtrate is usually reusable.

b. Precipitation - The precipitation of heavy metals can be accomplished by pH adjustment and the addition of coagulation agents. This usually produces a concentrated radioactive sludge which must be dewatered and disposed of at a licensed landfill. Supernate can be reused, or if sufficient removal is obtained, discharged.

c. Oxidation/Reduction - Oxidation or reduction of certain waste may remove RCRA hazard. For example, the reduction of chrome waste from the hexavalent state to the trivalent state reduces its toxicity and its RCRA characteristic hazard. The resultant radioactive waste must be disposed of at a licensed facility.

d. Solidification - Addition of absorbents or solidification agents to wastes which meet the definition of ignitable only under RCRA can change its classification simply by changing its physical form from a liquid to a solid. The solidified radioactive material would still need to be sent to a licensed disposal facility.

e. Treatment of Reactives - While each reactive waste would be treated with a specific technique, the treatment would render the waste non-reactive. An example could be the oxidation of a high sulfide waste with permangante. Thus converting the sulfide to sulfate and rendering it non-reactive. The resulting radioactive waste would need to be disposed of at a licensed facility

It should be pointed out that any treatment will involve increased possible exposures to personnel and environment, and all systems still require land-filling of the processed waste. In addition, the treatment processes will in most instances require a RCRA treatment permit from the EPA, thus increasing costs and implementation time. It is questionable as to whether the high cost of certain treatment methods could be considered cost effective compared to personnel exposure hazards and the minimal increase, if any, in the quality of the air and water in the vicinity of the licensed landlfill.

Each of these techniques is applicable only to certain specific waste types. For example, a reactive resin waste could be treated so that it no longer exhibited a reactive characteristic and thus was no longer a RCRA waste. It would then no longer be a mixed waste and could be disposed of at a low-level facility.

US Ecology believes that those materials containing solvents and materials such as rags, clothing, paper, etc. can be effectively incinerated and has demonstrated its belief by its proposal to build a low-level radioactive waste incinerator in North Carolina. It should be noted that incineration is a volume reduction technique, not a disposal technique. Attached to this response is a paper prepared by US Ecology in conjunction with Associated Technologies, Inc. (ATI) which discusses the radioactive incineration of low-level radioactive waste (Attachment B).*

*The attachment referred to has been retained in committee files.

At the present time there are incinerators available for the incineration of low-level radioactive wastes (including several federal facilities), but each of these is a relatively small unit designed to burn waste from a particular institution. There is not presently a commercial facility in this country.

There is no actual decontamination process, either chemical or mechanical, which will totally destroy the radioactive contamination. It may be possible to remove the radioactive contamination from one source or piece of equipment, but it is only transferred to another media. In instances where a process is designed to remove the chemical from the radioactive hazard, the result is to leave a generator now having to dispose of the radioactive material and the hazardous material as well. US Ecology is unaware of any alternative management or treatment options now available or likely to be available in the near future that would eliminate or minimize the need to dispose of low-level radioactive mixed waste in a licensed disposal facility. Similarly, US Ecology is unaware of treatment or management methods that will render radioactive materials benign such that they would not need to be disposed in a licensed facility.

Question 5. Please summarize all procedural and substantive problems with respect to the regulation of low-level radioactive mixed waste disposal. Are there conflicts in the regulatory requirements that have been established by NRC and EPA to implement the Atomic Energy Act and the Resource Conservation and Recovery Act? If so, please identify all such conflicts, including both procedural and substantive conflicts?

Answer. There are a large number of conflicts between the NRC regulations and the EPA regulations that reflect the differing approaches to the same goal -- protection of the public, and that must include employees, health and safety.

RCRA requires a verification of wastes at point of origin and at the facility prior to disposal. This makes sense for a chemical waste, but can only lead to unnecessary and hazardous exposures to workers at the disposal facilities. Because of the nature of low-level radioactive waste, it would be difficult in many cases to take representative samples, especially in the case of dry active wastes.

While RCRA requires the pumping of leachate, NRC regulations discourage it because of the greater spread of contamination that would be caused by this practice. US Ecology's written statement and prior testimony before Congress contain more specificity regarding the significant conflicts between the two sets of regulations. However, I would point out here one major philosophical difference -- RCRA is designed to eliminate shallow land burial for hazardous wastes whereas the Low-Level Radioactive Waste Policy Amendments Act of 1985 relies almost exclusively on this method in meeting the stringent deadlines for new site development.

US Ecology has put together an illustrative comparison of the requirements of 40 CFR 264 and 10 CFR 61 which highlights the apparent contradictions between the two regulations. It is attached hereto as an exhibit in answer to Question 5 (Attachment C). A much more detailed comparison is included as an appendix to a report prepared by the Department of Energy which is entitled "Comparisons of Regulations for Low-Level Waste Disposal and Hazardous Waste Disposal". A copy of that Appendix, of approximately 50 pages, is also enclosed for your review (Attachment D).*

*Attachment D has been retained in committee files.

Questions 6 & 7. What recommendations, if any, do you have for resolving any procedural or substantive conflicts under the framework of the existing law? Can any of these problems be resolved in the framework of the existing law?

What recommendations, if any, do you have for new legislative authority to address these procedural and substantive problems? Please explain in detail the need and justification for any suggested legislative changes.

Under the present set of circumstances, it appears unlikely, at best, that the mixed waste issue can be expeditiously resolved by the NRC and EPA. US Ecology bases this on the fact that in 1980 US Ecology asked EPA for an interpretation of the potential dual regulation of this material. We asked again in 1983 and in 1985, and have yet to receive any definite response. The agencies are either unwilling or unable to address this issue through the administrative process. I therefore see little hope for a resolution of this issue without new legislation mandating that the NRC be vested with full authority for accomplishing this reconcilliation and is designated as the sole licensing authority. Such a designation should contain a legislatively mandated performance schedule.

Question 8. Do you support the procedural approach established in section 11 of S. 1478, as passed by the Senate, for resolving any conflicts between EPA and NRC in the regulation of low-level radioactive mixed wastes?

Answer. US Ecology generally supports the procedural approach of Section 11 of Senate Bill 1578 to resolve conflicts between EPA and the NRC. The company feels very strongly that the resolution of this issue must be accomplished at the federal level. Unless and until there is a comprehensive national plan for the disposal of mixed wastes, new site development and construction could be delayed or totally frustrated.

Under the circumstances it is our recommendation that:

- the NRC be vested with the authority to regulate all radioactive wastes including naturally occurring and accelerator produced wastes;

- the NRC be vested with permitting authority to regulate mixed wastes, i.e. those low-level radioactive wastes that contain a mixture of radioactive and hazardous waste;

- a national scheme for the regulation of mixed wastes be developed so as to provide uniformity among the several states.

Exhibit C

NRC-EPA Regulation of
Low-Level Radioactive Waste Sites

The commercial low-level radioactive waste sites dispose of source, by-product and small quantities of special nuclear material under the aegis of the Atomic Energy Act of 1954, as amended. Naturally occurring radioactive materials,* accelerator produced isotopes and hazardous waste are regulated by the several states and EPA under RCRA. All of the commercial sites are engaged in the disposal of low-level atomic energy waste and NARM wastes, with minute quantities of hazardous waste comingled with the rad waste, e.g. organic solvents - scintillation vials.

Inasmuch as Part 61 of the NRC Regulations and 40 CFR 264 of the EPA Regulations have the same goal in mind, that is the protection of the public health and safety. There appears to be no need for dual regulation of these sites to achieve this objective. Differences in approach to the goal of health and safety are few, but of concern, should dual regulation be required. They are set out herein:

EPA/NRC DISPOSAL
Requirements

EPA Hazardous Waste Disposal Permit Requirements 40 CFR 264	NRC Low Level Radioactive Waste Licensing Requirements 10 CFR 61
o Requires detail chemical and physical analysis of representative sample prior to treatment or disposal. Liability on operator (264.136(a)(1)	o Generator/packagers assure that classificati characteristic, and stability satisfy 61.55 and 61.56 (20.311).
o Analysis above will require chemical laboratory handling of sample.	o 61.55 and 61.56 provide classification and characteristics which assure suitability for land disposal. No accomodations made for treatment.
o Because of liability on disposer each movement of waste must be inspected and if necessary sampled and analyzed to assure identity matching manifest (264.13(a)(4) (drums must be opened).	o 61.56 (a)(8) requires treatment of hazardous component to minimize to extent practicable the hazard from non radioactive material. o Liability, assurances and QC program of generator eliminates need for disposer to open and inspect containers nor for chem lab to handle. In keeping with ALARA o Manifest must contain chemical form, solidfication agent, chealating agent,etc. (20.311)

*e.g. uranium
thorium
radium
tritium

EPA Hazardous Waste Disposal Permit Requirements 40 CFR 264	NRC Low Level Radioactive Waste Licensing Requirements 10 CFR 61
o Requires inspection and if necessary analyses of incoming wastes and reporting of manifest discrepancies in type or quantity (264.72)	o ALAR discourages opening of containers. Identification liability is on generator manifest discrepancies in type and are not detectable at disposal facility.
o Requires operating record containing waste analyses and inspection results 264.73.	o Analysis and inspection of waste movement discouraged due to ALARA.
o Requires detection and compliance monitoring of chemicals. Also, corrective action as part of permit. Monitoring parameters are of chemical nature and comprise the groundwater protection standard and hazardous constituent and concentration limits list 264 Subpart F.	o Requirements for groundwater monitoring address only radionuclides. (61.53)
o Requires operation and closure that will minimize ongoing maintenance (264.111) + 264.301).	o Requires operation and closure to achieve stability necessary to eliminate the need for ongoing maintenance to the maximum extent possible (61.13, 61.44, 61.52)
o Requires 30 years post closure (264.117)	o Requires 5 year post closure care and 100 year institutional control (61.70).
o Maintenance after post closure care accomodated by post closure liability tax on RCRA hazardous wastes.	o Funding for institutional care (100 years) provided via PC&M fund which is collected from disposer based on waste receipt.
0 Requires synthetic liners (264.301)	o Combines site locational characteristics waste stability and necessary constructe barriers to minimize contaminant migration to groundwater (61.50, 51.51).
o Require leachate collection and removal systems. (264.301)	o Discourages leachate collection and removal systems due to long term maintenance (p. 547450 of FR 47) rely instead on locational characteristi and stability.
o Require removal, treatment, and disposal of contaminated leachate. (264.301)	o ALARA is violated if contaminated leachate is handled, increasing exposure. Reliance is instead on prevention of the need.
o No requirement	o RCRA hazardous waste must be treated to reduce to maximum extent practicable the potential hazard from non radiological materials (61.566)(8).

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Detox, Inc.
Associated Technologies, Inc.

In reply refer to: OGA-86-513

American Ecology

June 10, 1986

Senator Alan K. Simpson
Chairman
Subcommittee on Nuclear Regulation
Committee of Environment & Public Works
UNITED STATES SENATE
Washington, D. C. 20510

Dear Senator Simpson:

I am enclosing at your request our answers to the questions raised by you and Senators Stafford and Lautenberg arising out of the mixed waste hearings held on March 25, 1986 before the Subcommittee on Nuclear Regulation and the Subcommittee on Environmental Pollution, of the Senate Committee on Environment and Public Works.

I want to thank you for affording me the opportunity to testify before your committee and I look forward to working with you as you work toward a solution to the mixed waste issue.

Sincerely,

J. J. Scoville

J. J. Scoville
President
US ECOLOGY, INC.

JJS:rvh

QUESTIONS FOR JERRY J. SCOVILLE, PRESIDENT, US ECOLOGY, INC.

FROM SENATOR ALAN K. SIMPSON

QUESTION 1.

PLEASE PROVIDE YOUR VIEWS ON THE BROOKHAVEN SURVEY OF MIXED WASTE, COMPLETED LAST YEAR FOR THE NRC. IS THIS AN ACCURATE AND COMPREHENSIVE SURVEY OF THE TYPES AND VOLUMES OF MIXED WASTE CURRENTLY BEING GENERATED IN THE COMMERCIAL SECTOR?

ANSWER

We believe, by its own admission, the Brookhaven report is a less than accurate portrayal of the total mixed waste issue. The analysis relied upon surveys of classes of generators and a disproportionately small number of medical institutions responded to the survey. It was also stated in the analysis that many of those responding to the survey were probably uninformed and unfamiliar with RCRA regulations to which they were responding.

At the heart of this problem is the issue of what is a mixed waste. Without a definite answer to this root question, the Brookhaven report and any projection we could make with respect to the amount of mixed waste is just conjecture. Our concern is that without a comprehensive federal definition in the near future, such conjecture will also be made by each and every state regulatory agency, and that will lead to unequal enforcement measures as well as major difficulties in trying to site any new LLRW disposal sites.

With the exception of resins, scintillation liquids and vials containing organic chemicals, it is impossible for US Ecology to determine the types or amounts of mixed wastes that have been identified by the Brookhaven Report and which may have been accepted for disposal, inasmuch as none of the wastes have been identified by their generators as containing the potentially RCRA regulated materials listed in

the Brookhaven Report, e.g., chromium or mercury. The wastes are generated at those facilities identified in the Brookhaven Report and US Ecology would not dispute those sources of generation as delineated therein. However, we have no information regarding the ultimate disposal of such waste. What is manifest from the Brookhaven Report is that before the extent of the mixed waste issue is understood and effectively managed, mixed waste must be defined, and those generators of mixed wastes must be educated as to their regulatory responsibilities.

QUESTION 2.

DO YOU AGREE WITH THE BROOKHAVEN CONCLUSION THAT APPROXIMATELY THREE PERCENT OF THE TOTAL LOW-LEVEL WASTE IS MIXED WASTE, AND THAT IT COMES PRIMARILY FROM THREE SOURCES: (A) ORGANIC LIQUIDS ASSOCIATED WITH SCINTILLATION VIALS: (B) LEAD SHIELDING: AND (C) CHROMATES FROM ION EXCHANGE RESINS USED IN POWER REACTORS?

ANSWER

The Brookhaven report estimates that the total of mixed waste generated on an annual basis is less than 3 percent for medical wastes, up to 20 percent of all the waste generated in the country if you include lead shielding and other factors for reactor wastes.

If you use another indicator, basing it upon the receipt of wastes at the sites which US ECOLOGY operates and the number of wastes that have been identified by generators as hazardous or mixed wastes under RCRA, the answer would be zero. This is because we have never received any waste shipment at a low-level waste site that was manifested as RCRA regulated as required by law.

If generators have been shipping such wastes to our facilities, then they have been in violation of manifesting and analysis requirements set forth under RCRA. In this case, we may nave a number

of institutions including major hospitals around the country subject to criminal penalties.

Further, if certain specific waste streams are identified as RCRA controlled wastes, have they come from generators who are exempt under the small generator exemption in RCRA and, therefore, would not be classified as a mixed waste? The RCRA tracking system puts the burden on the generator to determine whether it qualifies for the exemption. You need to ask the generators directly if their wastes al fall within the exemption.

QUESTION 3.

DO WE HAVE THE REGULATIONS IN PLACE TODAY TO REGULATE THE DISPOSAL OF MIXED WASTE, IF A SHIPPER OR SITE OPERATOR WANTED TO DISPOSE OF THIS WASTE IN ONE OF THE THREE LICENSED SHALLOW LAND BURIAL FACILITIES?

ANSWER

We do not have regulations in place today to regulate the disposal of mixed waste inasmuch as 'mixed wastes' have yet to be defined. This matter was first brought to the attention of EPA by US Ecology some six years ago and to this date EPA and NRC have not been able to come to grips with this issue. It is our view that with some modifications to NRC's 10 CFR, Part 61, this problem could readily be resolved.

QUESTION 4.

DO ANY OF THE CURRENTLY-OPERATING LOW-LEVEL WASTE DISPOSAL FACILITIES MEET ALL OF THE REQUIREMENTS THAT ARE NECESSARY, UNDER RCRA AND THE ATOMIC ENERGY ACT, TO DISPOSE OF MIXED WASTES?

ANSWER

With differing requirements for the shallow land burial of low-level radioactive wastes and hazardous wastes on the part of the NRC and EPA the answer is: "No." What the necessary requirements are will depend upon the outcome of negotiations between the NRC and EPA that have been ongoing for several years.

QUESTION 5.

ARE THE REGULATIONS THAT HAVE BEEN ESTABLISHED BY THE NRC FOR LOW-LEVEL WASTE DISPOSAL UNDER PART 61 ADEQUATE, IN YOUR VIEW, TO PROVIDE A DEGREE OF PROTECTION COMPARABLE TO THAT AFFORDED UNDER RCRA, IF MIXED WASTE IS DISPOSED OF IN ONE OF THESE SITES?

ANSWER

Yes, in part. However, to accommodate some of the concerns of EPA, modifications to 10 CFR, Part 61 would be required.

QUESTION 6.

WOULD IT MAKE SENSE TO PROHIBIT THE DISPOSAL OF MIXED WASTE IN EXISTING AND FUTURE SITES, SO THAT STATES AND COMPACT REGIONS CAN GET ON WITH THE TASK OF LOCATING DISPOSAL SITES FOR RADIOACTIVE WASTE DISPOSAL, PARTICULARLY IF NONE OF THE CURRENTLY-OPERATING LOW-LEVEL WASTE SITES MEETS THE REQUIREMENTS UNDER RCRA NECESSARY TO ACCEPT MIXED HAZARDOUS WASTES?

ANSWER

It makes no sense whatsoever to prohibit the disposal of mixed waste in existing and future sites so that states and compact regions can get on with the task of locating low-level radioactive waste disposal sites. What makes sense is to require the EPA and the NRC to knuckle down and to resolve the "mixed waste" issue without

further delay. This requires Congressional action during this session of the Congress for the record clearly demonstrates that the two agencies are incapable of resolving the problem on their own. Failure to reach an accord on the problem may result in the creation of a class of orphan waste. Many of the generators who produce such waste i.e., hospitals, may lack storage capacity to deal with this problem other than on a near term basis.

QUESTION 7.

TO WHAT EXTENT DOES OUR EXPERIENCE WITH THE SCINTILLATION VIALS, AND THE CURRENT PROHIBITION ON THEIR DISPOSAL, SUGGEST THAT A PROHIBITION ON THE DISPOSAL OF MIXED WASTE MIGHT ACTUALLY HAVE A POSITIVE EFFECT OF ENCOURAGING ALTERNATIVE TREATMENT AND MANAGEMENT OPTIONS?

ANSWER

There is no question that a prohibition on the disposal of mixed wastes might well have a positive effect in encouraging alternative treatment and management options--but that would be like throwing out the baby with the bath water. In short, you would be creating an orphan waste while awaiting the management option. The wastes we are receiving today have not demonstrated that there is a hazardous waste problem. If modification to 10 CFR, Part 61 are dictated let's make them, and in parallel develop alternate treatment and management options. The protection of the public health and safety require timely disposal. A prohibition on the disposal of mixed wastes would defeat that objective.

QUESTION 8.

IS IT GOING TO BE POSSIBLE TO BREAK THE LOGJAM ON THE REGULATION OF MIXED WASTE DISPOSAL WITHIN THE CURRENT STATUTORY FRAMEWORK, OR ARE WE GOING TO NEED TO CONSIDER A CHANGE IN THE LEGISLATION TO CLARIFY THE PROCEDURAL AND SUBSTANTIVE RESPONSIBILITY FOR REGULATION OF MIXED WASTE DISPOSAL?

ANSWER

Under the present set of circumstances, It appears unlikely at best, that the mixed waste issue can be expeditiously resolved by the NRC and EPA.

US Ecology bases this on the fact that in 1980 US Ecology asked EPA for an interpretation of the potential dual regulation of this material. We asked again in 1983 and in 1985, and have yet to receive any definite response. The agencies are either unwilling or unable to address this issue through the administrative process. We therefore see little hope for a resolution of this issue without new legislation mandating that the NRC be vested with full authority for accomplishing this reconciliation and is designated as the sole licensing authority. Such a designation should contain a legislatively mandated performance schedule.

It is our proposal that:

- o the NRC be vested with permitting authority to regulate "mixed wastes," i.e. those low-level radioactive wastes that contain a mixture of radioactive and hazardous waste;
- o a national scheme for the regulation of "mixed wastes" be developed so as to provide uniformity among the several states;
- o the NRC be vested with the authority to regulate all radioactive wastes including naturally occurring and accelerator produced wastes.

QUESTION 9.

IF NO CHANGES ARE MADE LEGISLATIVELY AND IF, AS IT APPEARS, THE EXISTING SITES DO NOT MEET THE REQUIREMENTS NECESSARY TO ACCEPT MIXED WASTE FOR DISPOSAL, ARE WE ESSENTIALLY FACED WITH A SITUATION TODAY WHERE ALL OF THIS MIXED WASTE IS, IN EFFECT, ALREADY "ORPHAN WASTE"?

ANSWER

Until the EPA and the NRC determine what are mixed wastes the only "orphan wastes" that are not being disposed of today by shallow land burial are scintillation liquids and vials containing organic chemicals.

Even these wastes have found an interim home in that it is our understanding that they are being sent to a facility in Florida where the vials are crushed and the scintillation fluid used as a fuel in a cement kiln. Whether this process meets all regulatory requirements i.e., EPA/NRC under RCRA, is best left to those agencies interpretation, as well as that of the State of Florida.

QUESTION 10.

WOULD YOU SUPPORT LEGISLATION TO ALLOW EPA TO DELEGATE ITS RCRA PERMITTING RESPONSIBILITY TO THE NRC, TO CONSOLIDATE ALL PERMITTING IN A SINGLE AGENCY FOR MIXED WASTE?

ANSWER

US Ecology has urged from the inception of the mixed waste problem that the NRC be the sole regulatory agency for the disposal of mixed wastes. This position goes far beyond legislative authority to "allow" EPA to delegate its RCRA permitting responsibility to the NRC. The legislation should remove any responsibility on the part of EPA for the regulation of mixed wastes, other than in a consulting capacity,

as well as its responsibility under RCRA for the regulation of natural occurring and accelerator produced low-level radioactive waste (NARM). To overlook the NARM waste issue places EPA in the position of regulating a low-level radioactive waste site already regulated by the NRC. Such dual regulation is neither necessary nor desirable.

QUESTION 11.

IF NOTHING IS DONE LEGISLATIVELY TO ADDRESS THE MIXED WASTE ISSUE, WHAT IMPACT, IF ANY, WILL THIS HAVE ON THE ABILITY OF STATES AND SITE OPERATORS TO MEET THE MILESTONES ESTABLISHED IN THE RECENTLY ENACTED LOW-LEVEL WASTE ACT?

ANSWER

The Low-Level Radioactive Waste Policy Amendments Act of 1985 (PL 99-240) requires among other things that by January 1, 1988 a state or compact region shall develop a plan to identify the process for characterizing the preferred site(s), completing all necessary environmental assessments and processing a license application for submission to the NRC or an Agreement State. Attachs. A & B* set forth some of the major differences between the present NRC regulations (10 CFR Part 61) for the disposal of low-level radioactive waste and those of the EPA for the disposal of hazardous wastes. If these differences are not resolved, compact regions and states will be hard pressed to develop their concept of an appropriate regulatory program and to give the proper guidance to prospective operators, thus making it almost impossible to meet the January 1, 1988 deadline, but a year and a half away.

To further complicate the issue, it is our understanding that the EPA is still working on a development of siting criteria which it plans to complete in 1988--after the states and compact regions are

*The attachments referred to have been retained in committee files.

9.

QUESTIONS FOR JERRY J. SCOVILLE, PRESIDENT, US ECOLOGY

FROM SENATOR ROBERT T. STAFFORD

QUESTION 1.

ARE MIXED WASTES NOW BEING DISPOSED OF OR MANAGED SAFELY? PLEASE EXPLAIN.

ANSWER

As I indicated in my testimony on March 25, 1986, until the EPA and the NRC agree on a definition of "mixed waste" it is not possible to be responsive to your question. However, on our own initiative we have ceased the receipt of all scintillation liquids and vials containing organic chemicals. If generators are shipping "mixed wastes" to our facilities, they are not manifesting them as such and are accordingly in violation of the manifesting and analysis requirements under RCRA. All shipments coming into our facilities are managed safely, and if they contain "mixed wastes" there is no evidence that these wastes, undefined, are creating a hazard to the public health and safety.

QUESTION 2.

IF MIXED WASTES ARE NOW BEING DISPOSED OF OR MANAGED SAFELY, IS THERE A NEED FOR LEGISLATIVE OR ADMINISTRATIVE ACTION AIMED AT RECONCILING THE NRC AND EPA REGULATIONS GOVERNING LAND DISPOSAL OF MIXED WASTE?

ANSWER

While all wastes being disposed of at our facilities meet the regulatory requirements of the NRC, if in fact some of these wastes contain a hazardous waste component, then there are inconsistencies between NRC's regulation and those of the EPA, as well as some of the statutory requirements of RCRA. We were confident over the past few years that most of the inconsistencies between the two regulatory

programs could have been resolved, but the record has demonstrated otherwise. Accordingly, in our view legislation during this session of the Congress is a must if we are not to create vast confusion upon the part of generators, operators and the states in attempting to carry out the mandate contained in the LLRWPAA of 1985. Therefore, it is our recommendation that:

- o the NRC be vested with permitting authority to regulate "mixed wastes," i.e. those low-level radioactive wastes that contain a mixture of radioactive and hazardous waste;
- o a national scheme for the regulation of "mixed wastes" be developed so as to provide uniformity among the several states;
- o the NRC be vested with the authority to regulate all radioactive wastes including naturally occurring and accelerator produced wastes.

QUESTION 3.

ARE THERE ANY IMPEDIMENTS TO FUTURE DISPOSAL OR MANAGEMENT OF MIXED WASTES IN A SAFE MANNER? IF SO, WHAT ARE THEY?

ANSWER

In our view there is no major impediment to the future disposal or management of mixed wastes in a safe manner. Both the NRC and the EPA regulations are bottomed on a single goal--the protection of the health and safety of the public. Experience to date demonstrates that both agencies have made every effort to adhere to that goal. The real impediment arises as a result of legislative and regulatory inconsistencies (Attachments A & B)* between RCRA, as amended, and the Atomic Energy Act of 1954, as amended, when faced with the regulation of mixed wastes. Absent the ability of EPA

*Retained in committee files.

and NRC to resolve these inconsistencies, there may very well be created an orphan waste that if not disposed of properly could jeopardize the health and safety of the public.

QUESTION 4.

IS MANAGEMENT AND TREATMENT OF MIXED WASTE AN ALTERNATIVE TO LAND DISPOSAL? HOW MUCH OF THE COMMERCIAL MIXED WASTE CAN BE TREATED RATHER THAN DISPOSAL IN A LAND BURIAL FACILITY?

ANSWER

The treatment of mixed waste is a partial alternative to land disposal. However, it is not the complete solution. The NRC regulations, 10 CFR Part 61.56(a)(8) requires generators to treat wastes containing hazardous ..... material so as to reduce to the maximum extent practicable the potential hazard from the non-radiological materials. Thus, in effect, there is a presently ongoing program for the treatment of mixed wastes. Nonetheless, without a clear definition as to what is a "mixed waste," it is impossible to determine how much commercial mixed waste can be treated rather than disposed of in a land burial facility.

QUESTION 5

WILL THE EPA'S REVISION OF ITS RCRA FACILITY OPERATION AND SITING REGULATIONS AFFECT THE SITING PROCESS FOR NEW LLRW WASTE DISPOSAL FACILITIES?

ANSWER

As of this writing we are not aware of any EPA revision of its RCRA facility operation and siting regulations. Current RCRA regulations for the disposal of hazardous waste do conflict with those of NRC and until these differences are eliminated, the construction and operation of new LLRW waste disposal sites will be seriously jeopardized.

QUESTIONS FOR JJS FROM SENATOR FRANK R. LAUTERBERG

1. Are the current incineration technologies sufficient to ensure adequate protection of human health and the environment? If improvements are needed, at what stage(s) is(are) improvements needed, e.g., development, design, implementation or others?

RESPONSE:

. A variety of incinerator technologies have emerged that have been applied to the processing of combustible radioactive and chemical hazardous wastes. The major technologies applied include liquid injection, controlled air, rotary kiln and fluidized bed. Coupled with these combustion processes various methods for treating the flue gas emissions have been utilized. The selection of a suitable technology for both incineration and air pollution control is dependent upon the physical and chemical composition of the wastes to be processed and the specific needs for environmental control.

The two industries, radioactive waste incineration and chemical hazardous waste incineration, have developed under somewhat different philosophies. Radioactive waste incinerators have been developed to reduce the volume of radioactive materials while controlling the discharge of radionuclides. The radionuclides cannot be destroyed, so they must be controlled. Chemical wastes incinerators, especially under the requirements of the Resource Conservation and Recovery Act (RCRA), have placed their emphasis upon the distruction and removal efficiency of the chemical hazardous constituents in the waste feed. Also, the physical and chemical properties of the wastes generated by the two industries differ substantially in several areas; the low-level radioactive waste volume generated commercially is composed of a high percentage of dry type trash and a low percentage of organic liquids. Under both scenarios, the basic requirement for good combustion has been the driving force behind the development and modification of existing technology. Similar combustion processes and pollution control trains have been used for both waste

types. For this reason, the technology exists to incinerate either chemical, radioactive or mixed wastes, that is, wastes containing both radionuclides and chemical hazardous wastes.

The EPA has stated in its publication titled, "Assessment of Incineration as a Treatment Method for Liquid Organic Hazardous Wastes" the following:

> Determination of the efficiency of incineration on land and at-sea is based on performance, not design. To date, testing has shown that incinerators are capable of destroying at least 99.99 percent of those compounds used as an indicator of overall performance. Critics have raised issues concerning the completeness of this approach, about testing procedures, and about the reliability of using only selected compounds to represent a complex emission that has not been fully characterized. EPA scientists acknowledge the need to continue researching combustion processes, but also believe that the current approach is the best now available and does provide for effective protection of the environment and human health.

Because of the emphasis presently being placed on incineration by the EPA for disposal of chemical hazardous wastes innovative thermal hazardous waste treatment technologies are gaining popularity. This does not mean that the present more widely used technologies are not adequate to protect human health and the environment. However, these emerging alternative technologies will be utilized more for specialized, highly toxic waste streams that comprise a small percentage of the total hazardous waste volume generated.

2. How are incinerators of mixed wastes regulated, under what statutes and/or regulations, as disposal and/or treatment facilities? What permits and/or licenses are required?

RESPONSE:

Since there is no official definition of mixed wastes and therefore no comprehensive mixed waste regulations, incinerators fall under separate

regulations as outlined below. In the past, incinerators that processed materials that were by definition radioactive, have been required to receive a license from the NRC or from the state through the NRC's Agreement State Program. In 1981, the NRC delisted those materials containing .05 microcuries or less of hydrogen-3 and carbon-14 per gram of medium. These materials could be disposed of without regard to their radioactivity; however, the licensee must comply with other applicable federal, state and local regulations governing any other toxic or hazardous property of these materials.

Generators who plan to incinerate chemical hazardous waste under RCRA are required to submit an application (called a Part "B") to the EPA for review prior to them issuing a permit. Prior to the emergence of the "mixed wastes issue" generators that intended to incinerate low-level radioactive wastes applied to the NRC (or state) for a radioactive material license; generators that intended to incinerate chemical hazardous waste under RCRA applied for a Part "B" permit. The two waste streams were treated separate. In fact, under RCRA, any source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 is excluded. Now, however, with the emergence of the mixed wastes question several generators who were previously incinerating radioactive wastes materials have applied to the EPA for a RCRA Part "B" permit to cover their facility. In our efforts to construct and license a LLRW incinerator in North Carolina, we were told that we had to deal with four different regulatory bodies. The regulatory agencies are as follows:

- NRC or Agreement State for radioactive material license
- USEPA to address the Standards for Radionuclides - National Emission Standards for Hazardous Air Pollutants; 40 CFR 61, Subpart I
- EPA or state to address Solid Waste Management Act (RCRA)
- EPA or state to address Clean Air Act

To date we do not know of any incinerator in North Carolina, or indeed any other state, that has applied for or received all of the necessary permits that would allow them to process mixed wastes from multiple sources. For waste management facilities to be permitted in any reasonable length of time, it is mandatory that regulations be passed to simplify the permitting process.

To better clarify the present status of "mixed waste" regulations, we have included for reference the Statement of Marcia E. Williams, Director of Office of Solid Wastes, US EPA, before the subcommittee on Environmental Pollutions, March 25, 1986. *

3. What are the major toxic and chemical effluents? What is or should be monitored, what techniques are employed and how frequently is monitoring performed? What are the maximal amounts allowed in the effluents? What are the major contaminants in the ash?

RESPONSE:

The radioactive waste incinerator operators must monitor their feed input and stack effluent discharges to guarantee that their radionuclide discharges are within the limits of 10 CFR Part 20 - Standards for Protection Against Radiation. This standard requires that licenses restrict their discharge such that no individual in an unrestricted area will receive a dose to the whole body in any period of one calendar year in excess of 500 mrem (per ALARA limit is usually set at 10% mpc). The EPA regulations; Standards for Radionuclides - National Emission Standards for Hazardous Air Pollutants - 40 CFR Part 61 Subpart I restrict radionuclide discharges such that no individual will receive a dose to the whole body in any one year period in excess of 25 mrem. The EPA regulations are the more recent regulations; however, even they are still incomplete. In North Carolina, we were told that we could not begin construction of our proposed incinerator until the EPA issued us a permit based upon these incomplete regulations. This appeared to be a difficult if not impossible standard to meet especially since there has been no time set for finalization of the regulations.

* Attachment "C" (retained in committee files)

The radioactive waste incinerator can be monitored utilizing several techniques. One method that is used by most hospitals and universities is to limit the activity of the waste feed input, such that if all of the activity is discharged to the stack, the total activity would be within the facility's permit. This method can be used for facilities processing waste contaminated with small amounts of activity. For other facilities a stack monitor may be required to continuously sample the effluent and print out the activity discharged. This system would have to be supplemented with a batch sampler for carbon-14 and tritium.

Incinerators burning chemical hazardous wastes, as stated above, are required to achieve a destruction and removal efficiency (DRE) of 99.99 percent for each principal organic hazardous constituent (POHC) in the waste feed. Also, an incinerator destroying hazardous waste and emitting more than four pounds per hour of hydrogen chloride must be equipped with emission control equipment capable of removing 99 percent of the hydrogen chloride from the exhaust stack. Incinerators must be controlled to limit the particulate matter in the flue gases to concentrations less than 180 milligrams of particulates per dry standard cubic meter of stack gas. Trial burns have to be completed on the incinerators to allow performance standards to be set which will result in a DRF of 99.99 percent for the equipment. These operating requirements, for example carbon monoxide level in the stack, waste feed rate, combustion temperatures, and combustion gas flow rate, must be analysed during the trial burns and monitored during the processing operations.

If a mixed waste were being processed, monitoring for both radioactivity and chemical DRE would be required. Liquid scintillation vials (LSV) are the most quoted mixed waste at issue. The EPA has ranked organic hazardous constituents on the basis of their heat of combustion as an approximate indicator of incinerability. Both toluene, benzene and xylene (which are used in s-vials) by their ranking, are easily incinerated. This would indicate that for incineration for these materials it should be fairly easy to achieve the DRE required by the RCRA regulations.

17.

The constituents in the ash remaining after combustion are very dependent upon the method of incineration, the type of waste, and the degree of radioactivity present. The isotopes of carbon-14 and tritium will be discharged into the atmosphere. Other isotopes will have varying decontamination factors (DF) depending upon the design of the combustion equipment, physical form of the isotope, and air pollution control equipment present. The isotopes will be either retained in the ash, collect in the process equipment, removed and held by the scrubber liquor (if present), or be discharged out the stack. Heavy metals tend to collect in the incinerator ash; thus the ash could be radioactive and also toxic based upon an EP toxicity test. Therefore, for a "mixed waste" incinerator the ash must be analyzed for both radioactivity and for the hazardous waste characteristics of the EPA under RCRA.

4. Are more incinerators needed to effectively process liquid scintillation vials (LSV) nationwide? How much LSV mixed waste is being produced in New Jersey each year? Who are the major generators? Where is this LSV waste going?

RESPONSE:

Again, we would like to state that there is no official definition for mixed wastes. Liquid scintillation vials should have been disposed of as either low-level radioactive waste if their activity was above de minimis levels or as RCRA hazardous wastes for de minimis vials generated by non-small quantity generators. De minimis vials disposed of by small quantity generators are not subject to RCRA regulations. Because of the confusion with the regulation, we are no longer accepting LSV materials at our Richland, Washington disposal facility. This was the only LLRW burial site permitted to receive this type waste. Where are these materials going now? There are presently many hospitals and universities that are incinerating their on-site generated wastes. Whether these facilities have been required to comply with all aspects of both RCRA and NRC regulations is not known. Some facilities are probaby storing their wastes for decay; others are shipping them off site for treatment or disposal. The facilities that we are aware of are:

- A facility in Colorado is processing de minimis LSV by removing the liquid and rinsing the glass. This facility has a RCRA storage permit. The liquids are being shipped off site for disposal.

- A facility in Florida is permitted by the state to process LSV containing de minimis quantities of carbon-14 and tritium plus twenty-six low energy beta emitting isotopes. This facility removes the liquid and ships it to a cement kiln for use as secondary fuel. The cement kiln does not have a RCRA permit.

- A facility in Texas is processing LSV above de minimis quantities by separating the liquid. The liquid is being shipped off site.

- A facility in Ohio is removing liquids from vials for de minimis quantities only. These liquids are being sent to a cement kiln for incineration.

The volume of low-level radioactive waste generated that contains LSV and organic liquids is small compared to the total volume of waste generated. The Brookhaven National Laboratory Report, NUREG/CR-4406, stated that from their survey it represented less than 2.5%. A presentation by Dr. Richard C. Reba before the Energy and the Environmental Subcommittees (included as reference)* stated that approximately 35,000 $feet^3$ of organic type materials were being generated by hospitals and universities. The volume is extremely small when compared to the total organic chemical hazardous waste generated nationally. However, even though the volume is small, since there are no definitions or specific regulations governing mixed wastes, the problem cannot be solved by adding additional incinerator capacity.

With the restriction of disposal of LSV at our Richland site, we have not disposed of any "mixed" waste from New Jersey. That waste is now being handled by brokers other than US Ecology. We do not know how much waste is being produced; being disposed of, who the major generators are, or where the wastes are going.

* Attachment "D" (retained in committee files)

5. How has the LSV industry, vials, fluids and scintillators adjusted to the need to minimize this waste stream? How have industry's response reduced the volume of the LSV waste so far?

RESPONSE:

The solvents most commonly used in LSV are toluene, benzene, and xylene, other substances are mixed with the solvent including the aqueous or organic sample for counting. Because of the difficulty in disposing of LSV containing these solvents, alternate compounds are being investigated as substitutes. However, these compounds were originally chosen because of their ability to act as a scintillator medium. An equally efficient medium probably will not be found.

We do not know how successful the generators or the manufacturers have been in reducing the volume of LSV (containing solvents)

STATEMENT

ON BEHALF OF THE

SOCIETY OF NUCLEAR MEDICINE

AND

THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS

BEFORE THE

SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
SUBCOMMITTEE ON NUCLEAR REGULATION

AND

SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

CONCERNING

THE REGULATION OF LOW-LEVEL "MIXED" HAZARDOUS AND
RADIOACTIVE WASTES

PRESENTED BY

RICHARD C. REBA, M.D.

AND

CAPT. WILLIAM H. BRINER (USPHS RET)

MARCH 25, 1986

MR. CHAIRMAN, I AM RICHARD C. REBA, M.D., DIRECTOR OF THE DIVISION OF NUCLEAR MEDICINE AT GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER. I AM SPEAKING HERE TODAY ON BEHALF OF THE AMERICAN COLLEGE OF NUCLEAR PHYSICIANS (OF WHICH I AM PAST PRESIDENT) AND THE SOCIETY OF NUCLEAR MEDICINE. THE TWO ORGANIZATIONS TOGETHER REPRESENT APPROXIMATELY 12,000 PHYSICIANS, SCIENTISTS, AND OTHER HEALTH PROFESSIONALS ENGAGED IN RESEARCH IN, AND THE MEDICAL USE OF, NUCLEAR ISOTOPES. WITH ME IS CAPTAIN WILLIAM H. BRINER, DIRECTOR OF THE NUCLEAR MEDICINE LABORATORY AT DUKE UNIVERSITY MEDICAL CENTER, AND CHAIRMAN OF GOVERNMENT RELATIONS FOR THE SOCIETY.

FIRST, LET ME EXPRESS OUR APPRECIATION TO THIS COMMITTEE FOR THE EFFORT AND THE INTELLIGENCE WHICH YOU AND YOUR STAFF PUT INTO DEVELOPING THE LOW-LEVEL WASTE AMENDMENTS OF 1985. THE ACT PROVIDES A WELL-CRAFTED BALANCE OF MILESTONES, OF INCENTIVES, AND OF PENALTIES. TOGETHER THESE SHOULD STIMULATE THE STATES WHICH HAVE NOT YET ENTERED INTO COMPACTS TO MOVE QUICKLY, WHILE ASSISTING REGIONS WITH COMPACTS TO GET ON WITH THE EVEN MORE DIFFICLULT DECISIONS CONCERNING SITING AND DEVELOPMENT OF NEW LOW-LEVEL WASTE DISPOSAL SITES.

LET ME BRIEFLY REVIEW THE CURRENT SITUATION IN THE REGULATION AND DISPOSAL OF MIXED MEDICAL WASTE -- RADIOACTIVE MEDICAL WASTES CONTAINING LIQUIDS OR COMPOUNDS REGULATED UNDER THE RESOURCE CONSERVATION AND RECOVERY ACT. ACCORDING TO THE DECEMBER 1985 REPORT OF THE CONFERENCE OF RADIATION CONTROL PROGRAM DIRECTORS UNDER CONTRACT TO THE DEPARTMENT OF ENERGY, ACADEMIC AND MEDICAL INSTITUTIONS GENERATED APPROXIMATELY 102,000 CUBIC FEET OF LOW-LEVEL RADIOACTIVE WASTE IN 1984. THIS IS ABOUT FOUR PERCENT

OF THE NATION'S LOW-LEVEL WASTE. A SURVEY THE SAME YEAR BY BROOKHAVEN NATIONAL LABORATORIES FOR THE NUCLEAR REGULATORY COMMISSION SHOWED THAT APPROXIMATELY 34 PERCENT OF THESE WASTES CONSISTED OF LIQUID SCINTILLATION COUNTING SOLUTIONS OR OTHER ORGANIC LIQUIDS REGULATED UNDER RCRA. (THE ABOVE FIGURES FOR LOW-LEVEL WASTES DO NOT INCLUDE WASTE GENERATED BY RADIOPHARMACEUTICAL MANUFACTURERS.)

THESE SCINTILLATION AND OTHER ORGANIC LIQUID WASTES ARE THE PRODUCT OF CLINICAL DIAGNOSTIC TESTING IN NUCLEAR MEDICINE LABORATORIES AND OF THE DEVELOPMENT OF NEW PRESCRIPTION DRUGS, INCLUDING THOSE WHICH ARE RADIOACTIVE, AT RESEARCH INSTITUTIONS. UNTIL NOVEMBER 1985, MOST OF THESE MEDICAL WASTES WERE BEING SHIPPED, VIA BROKERS, TO THE RICHLAND DISPOSAL FACILITY FOR SHALLOW LAND BURIAL. ON NOVEMBER 8, THAT FACILITY (UNABLE TO COMPLY WITH EPA REGULATIONS) FILED A CLOSURE NOTICE FOR ITS DISPOSAL OPERATIONS WHICH INCLUDED HAZARDOUS CHEMICALS AND STOPPED ACCEPTING LIQUID WASTES. THESE MIXED MEDICAL WASTES ARE NOW BEING BURNED -- SOME IN WASTE INCINERATORS AT THE FACILITIES WHICH GENERATE THEM, BUT MOST AT ONE COMMERCIAL FACILITY IN FLORIDA WHERE THE ORGANICS ARE MIXED WITH FUEL OIL AND BURNED FOR HEAT GENERATION. A VERY SMALL QUANTITY OF LIQUID SCINTILLATION VIALS CONTAINING RADIOACTIVE WASTES OF A HIGHER ACTIVITY THAN IS ACCEPTED AT THIS FACILITY ARE BEING STORED AT RESEARCH INSTITUTIONS UNTIL ANOTHER MEANS OF DISPOSAL BECOMES AVAILABLE.

LEAD SHIPPING CONTAINERS PRESENT A SECOND TYPE OF MIXED WASTES OF CONCERN TO MEDICAL AND ACADEMIC GENERATORS. SOME OF THE LOW-LEVEL WASTE SHIPPED BY MEDICAL AND RESEARCH INSTITUTIONS AND BY RADIOPHARMACEUTICAL

SUPPLIERS IS CONTAINED IN LEAD SHIELDING. THE NEED TO PREVENT EXPOSURE AT THE LOW-LEVEL BURIAL SITE MEANS THAT REPACKAGING IS COMPLICATED. AS A CONSEQUENCE, WASTES ARE OFTEN BURIED IN THESE CONTAINERS.

AT PRESENT, NEITHER THE OPERATORS OF THE RICHLAND SITE NOR THE PLANNING AGENCIES ATTEMPTING TO DEVELOP NEW DISPOSAL SITES IN THEIR REGIONS KNOW IF EITHER THE RICHLAND OR ANY OTHER FACILITY WILL EVER AGAIN BE ABLE TO COMPLY WITH BOTH EPA AND NRC REGULATIONS. CONSEQUENTLY, THEY DO NOT KNOW WHETHER SITING PLANS SHOULD INCLUDE CONSIDERATIONS FOR HANDLING ORGANIC LIQUID WASTE OR WHAT THOSE REGULATORY CONSIDERATIONS SHOULD BE.

TWO CONCLUSIONS FOLLOW FROM THIS SITUATION.

FIRST, THE RESEARCH AND MEDICAL COMMUNITY IS NOW TOTALLY DEPENDENT ON ONE DISPOSAL FACILITY FOR HANDLING THE GREAT MAJORITY OF THE LOW-LEVEL MIXED LIQUID WASTES GENERATED BY CLINICAL DIAGNOSTIC TESTS NATIONWIDE AND BY THE RESEARCH CRITICAL TO CONTINUING MEDICAL ADVANCES. THIS IS NOT PRUDENT POLICY. WHILE INCINERATION OF THESE WASTES MAY BE THE TECHNOLOGY OF CHOICE, THERE IS NO COMMERCIAL LOW-LEVEL WASTE INCINERATION FACILITY IN THIS COUNTRY SPECIFICALLY DESIGNED AND DEVELOPED FOR THIS PURPOSE. THIS IS DUE, FOR THE MOST PART, TO THE REGULATORY IMPASSE FACING US TODAY.

SECOND, THE UNCERTAINTY OVER FUTURE REGULATIONS THREATENS TO DELAY THE CRITICAL DECISIONS FACING OUR STATES AND REGIONS. AS YOU KNOW, EVERY REGION (OR INDIVIDUAL STATE) MUST DEVELOP A SITING PLAN BY JANUARY 1988 AND FILE A COMPLETE APPLICATION BY JANUARY 1990. STATES WHICH MISS THESE MILESTONES FACE ESCALATING PENALTY SURCHARGES AND POSSIBLE LOSS OF ACCESS. THE COMMISSIONS MAKING THESE SITING DECISIONS AND DEVELOPING THE ENGINEERING

PLANS MUST KNOW WHETHER OR NOT THE FACILITY SHOULD PROVIDE FOR THE DISPOSAL OF LIQUID WASTES SUBJECT TO RCRA AND OF WASTES CONTAINED IN LEAD SHIPPING CONTAINERS. PLANNING IN SOME STATES IS ALREADY FAR ALONG. UNLESS THIS ISSUE IS RESOLVED, THOSE SITES MAY NEVER BE ABLE TO ACCEPT MIXED WASTES.

THE CURRENT STUDY BY THE BROOKHAVEN NATIONAL LABORATORIES OUTLINES THE DIFFERENCES BETWEEN EPA AND NRC REGULATIONS APPLYING TO MIXED WASTES. IT DOES NOT APPEAR TO US THAT THESE DIFFERENCES SHOULD BE IRRECONCILABLE. WHAT IS NEEDED IS THAT ONE AGENCY OR THE OTHER BE DESIGNATED THE LEAD AGENCY. SINCE THESE RADIOACTIVE WASTES ARE BEING DISPOSED OF AT SITES FOR WHICH THE NRC HAS TRADITIONALLY HAD RESPONSIBILITY, WE BELIEVE THAT THE NRC SHOULD BE THIS LEAD AGENCY. WE BELIEVE THAT THE REGULATIONS DEVELOPED BY THE NRC, IN CONSULTATION WITH EPA, CAN PROVIDE A LEVEL OF PROTECTION OF THE PUBLIC HEALTH AND ENVIRONMENT COMPARABLE TO THE LEVEL OF PROTECTION AFFORDED BY SUBTITLE C OF RCRA. IN THIS REGARD, WE ENDORSE THE POSITION RECENTLY ADOPTED BY THE NATIONAL GOVERNORS' ASSOCIATION.

AND FINALLY, WE BELIEVE THAT THE MANDATE OF CONGRESS TO THE LEAD AGENCY MUST INCLUDE THE CHARGE TO RESOLVE THIS REGULATORY IMPASSE QUICKLY. THE PROCEDURES CANNOT BE CUMBERSOME; THEY SHOULD NOT INCLUDE A NUMBER OF SUBSEQUENTIAL STEPS WHICH WILL CONSUME PRECIOUS TIME; THEY SHOULD BE ACHIEVABLE WITHIN TWELVE MONTHS. OTHERWISE, THE TIME LOST IN SITING DECISIONS WILL RESULT IN UTTER CHAOS.

THANK YOU AGAIN FOR THE STATESMANLIKE ACTION OF THIS COMMITTEE IN THE DEVELOPMENT OF LAST YEAR'S LOW-LEVEL WASTE AMENDMENTS AND THE CONSIDERATION OF THIS CONTINUING BOTHERSOME PROBLEM. PLEASE LET US KNOW AT ANYTIME WE CAN BE OF ASSISTANCE.

QUESTIONS FOR DR. RICHARD C. REBA

MIXED WASTE HEARING

Q: In December of 1985, the NRC published a report entitled "An Analysis of Low-Level Wastes: Review of Hazardous Regulations and Identification of Radioactive Mixed Wastes" (NUREG/CR-4406). Is this report, in your view, a comprehensive and accurate summary of all low-level radioactive mixed wastes that are currently being generated by the medical community? If not, what additional wastes would you classify as mixed wastes? Who generates these wastes? In what volumes? What hazardous substances are contained in these additional wastes that are subject to regulation under RCRA?

A: The Brookhaven study correctly reports that the greatest volume of mixed waste generated by the medical community is fluids from scintillation vials. However, smaller volumes of two other types of mixed liquid wastes are being generated: concentrations of tritium and some other radionuclides generated as the byproduct of the production of radiolabeled compounds used in research; and complex aromatic hydrocarbons containing radioisotopes which are used in highly sophisticated research in molecular biology. We estimate that the quantities of mixed wastes resulting from production of radiolabeled nuclides at 2000-3000 gallons a year. (See attached letters from DuPont/NEN).* We are unable to estimate the quantities of radioactive organic compounds resulting from academic research into pharmaceuticals and molecular biology; while the quantities are not great, they are extremely burdensome for research institutions which have neither the physical capacity nor the legal permits required for long term storage.

Q: Of the wastes identified in NUREG/CR-4406 that are generated by the medical community, which ones are currently being accepted for disposal at licensed low-level radioactive waste disposal sites? What treatment or disposal methods are currently being used by the generators of mixed waste in the medical community?

A: None of the mixed wastes generated by the medical community are being accecpted for disposal at licensed low-level radioactive disposal sites in the physical state in which they are generated or shipped. Most of the scintillation liquids are being burned at Quadrex in Florida. One broker has informed us that it is treating some of the aromatic hydrocarbon wastes by evaporation and solidification and that the resulting wastes are being accepted for disposal at the Richland facility. Other wastes, as at NEN/DuPont (see attached letters) are being stored until a means of disposal becomes available.

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*The letters referred to have been retained in committee files.

Q: Aside from disposal in a licensed low-level radioactive waste disposal facility, what other options are available for the treatment or management of low-level radioactive mixed wastes generated by the medical community? Can any or all of these wastes be effectively incinerated? If so, which ones? Are there facilities available that provide such a service? If so, where? What is the cost of incineration, by comparison to disposal in a licensed low-level radioactive disposal facility? Can any or all ofthese wastes be decontaminated, either through chemical, mechanical, or other processes? If so, which ones? Are there facilities available that provide such a service? If so, where? Aside from these options, are there other alternative management or treatment options now available , or likely to be available in the future, that would eliminate or minimize the need to dispose of low-level radioactive mixed wastes in a licensed low-level radioactive waste disposal facility? Can low-level radioactive mixed wastes be treated or managed so that disposal in a licensed low-level radioactive waste disposal facility is not necessary?

A: Most of the scintillation fluids generated by the medical and research community (and this is the greatest part of the mixed wastes from the medical/research community) are being directed by brokers to Quadrex, which crushes and separates the vials and then burns the resulting liquids in a cement kiln. This facility accepts only scintillation vials and scintillation liquids. In the case of C-14 and H^3, these must be at or below the NRC "de minimis" level. This is the only commercial facility burning these wastes. At the hearing May 6, EPA representatives stated that this facility does not have a RCRA permit at present and that one may be required in the future.

Other scintillation liquids are being incinerated by the institutions which generate them. Costs of incineration are acceptable, except that it is not feasible for a hospital or research institution to build an incineration facility for these wastes alone.

We are informed by the major U.S. manufacturer of radiolabeled compounds that they have been unable to find a disposal source or disposal technology for the byproduct wastes of the production of the radiolabeled compounds which they produce, which are essential to research into new drugs and into basic molecular biology. Some of the research institutions producing radioactive aromatic hydrocarbons are shipping these wastes through brokers to firms which evaporate these wastes to dryness for disposal; others at present have no outlet and are accumulating these wastes.

Most mixed wastes (lead is the exception) generated by medical and medical research institutions can safely be incinerated or otherwise managed so that disposal in a licensed low-level radioactive waste disposal facility as a liquid can become unnecessary. Only the ash or other dry residue must subsequently be buried. Unfortunately, the requisite commercial licensed and permitted incineration facilities do not exist at present, and

the firms which have applied for local permits to construct incineration facilities in the last several years have been denied the needed permissions. The major commercial manufacturer of radiolabeled compounds for research has been unable to identify a disposal source; no incineration facility licensed to incinerate these compounds now exists. The ability to solidify and subsequently to dispose of aromatic hydrocarbons from research institutions will depend upon decisions yet to come under RCRA, unless NRC (as we recommend) is given authority to set standards for disposal of these radioactive wastes at NRC-managed facilities.

Q: Please summarize all procedural and substantive problems with respect to the regulation of low-level radioactive mixed waste disposal. Are there conflicts in the regulatory requirements that have been established by NRC and EPA to implement the Atomic Energy Act and the Resource Conservation and Recovery Act? If so, please identify all such conflicts, including both procedural and substantive conflicts?

A: Table 2.5 of the recent Brookhaven study (NUREG 4406) identifies the differences and conflicts between EPA and NRC regulations applying to mixed wastes. We believe this is an accurate summary. The medical community on the whole depends on brokers and contractors to handle the disposal of its mixed wastes, as the volumes generated by any single institution are too small for the individual institution to manage its wastes alone (with the exception of those which have their own incineration facilities and permits). Therefore, these facilities discover the problems of disposal when, as at present, their brokers and contractors inform them that they can no longer accept their wastes for disposal.

Q: What recommendations, if any, do you have for resolving any procedural or substantive conflicts under the framework of the existing law? Can any of these problems be resolved in the framework of the existing law?

A: Experience to date shows that legislative direction to set one lead agency will be required, with disposal of mixed waste authorized at the existing sites until conflicts are resolved under one set of regulations.

Q: What recommendations, if any, do you have for new legislative authority to address these procedural and substantive problems. Please explain in detail the need and justification for any suggested legislative changes.

A: We believe these conflicts between EPA and NRC regulations and procedures will be resolved only if and when one agency is given authority and is directed to resolve these conflicts. As both EPA and NRC have stated that the chemical hazard is minimal and

these wastes have traditionally been disposed of safely at NRC-licensed facilities, we recommend that NRC be given this authority and directed to establish procedures for disposal of mixed radioactive and chemically hazardous wastes, under conditions satisfactory to RCRA, and that NRC be directed to finish this task within six months, so that the states and regions now trying to develop sites will know what regulations they have to meet. If NRC judges incineration of these wastes to be possible and preferable to land disposal, it should be charged to develop regulations which will permit and facilitate the development of one or more national commercial sites for incineration of mixed wastes.

Q: Do you support the procedural approach established in section 11 of S. 1578, as passed by the Senate, for resolving any conflicts between EPA and NRC in the regulation of low-level radioactive mixed wastes?

A: We recommend a straight-forward delegation of authority for permitting facilities to NRC. This should include authority to permit incineration facilities under the Clean Air Act as well as delegation of RCRA authority.

QUESTIONS FOR DR. RICHARD C. REBA
DIRECTOR, DIVISION OF NUCLEAR MEDICINE
GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER

FROM SENATOR ROBERT T. STAFFORD

Q: Are mixed wastes now being disposed of or managed safely? Please explain.

A: Most of the scintillation fluids generated by the medical and research community (and this is the greatest part of the mixed wastes from the medical/research community) are being directed by brokers to Quadrex, which crushes and separates the vials and then burns the resulting liquids in a cement kiln. This facility accepts only scintillation vials and scintillation liquids. In the case of C-14 and H-3, these must be at or below the NRC "de minimis" level. This is the only commercial facility burning these wastes. At the hearing May 6, EPA representatives stated that this facility does not have a RCRA permit at present and that one may be required in the future.

We are informed by the major U.S. manufacturer of radiolabeled compounds that they have been unable to find a disposal source or disposal technology for the byproduct wastes of the production of the radiolabeled compounds which they produce, which are essential to research into new drugs and into basic molecular biology. Some of the research institutions producing radioactive aromatic hydrocarbons are shipping these wastes through brokers to firms which evaporate these wastes to dryness for disposal; others at present have no outlet and are accumulating these wastes.

Most mixed wastes (lead is the exception) generated by medical and medical research institutions can safely be incinerated or otherwise managed so that disposal in a licensed low-level radioactive waste disposal facility as a liquid can become unnecessary. Only the ash or other dry residue must subsequently be buried.

We believe incineration is a proper means of disposal and that additional incineration facilities should be encouraged. However, as noted above, incineration facilities for all of these wastes do not now exist.

Q: If mixed wastes are now being disposed of or managed safely, is there a need for legislative or administrative action aimed at reconciling the NRC and EPA regulations governing land disposal of mixed wastes?

A: The inability of one major producer of radiolabelled compounds and of several research facilities to find a disposal site or licensed incineration facility at present indicates that action is needed by the Congress. It is not wise to permit these wastes

to accumulate indefinitely. In addition, we believe the dependence of the medical community on one single commercial facility for burning of the majority of all scintillation liquids is unwise policy.

Q: Are there any impediments to future disposal or management of mixed wastes in a safe manner? If so, what are they?

A: The conflicts between EPA and NRC regulations have been outlined by Brookhaven (NUREG 4406, table 2.5). We believe these conflicts between EPA and NRC regulations and procedures will be resolved only if and when one agency is given authority and is directed to resolve these conflicts. We recommend that NRC be given this authority and directed to establish procedures for disposal of mixed radioactive and chemically hazardous wastes, under conditions satisfactory to RCRA, and that NRC be directed to finish this task within six months, so that the states and regions now trying to develop sites will know what regulations they have to meet. If NRC judges incineration of these wastes to be possible and preferable to land disposal, it should be charged to develop regulations which will permit and facilitate the development of one or more national commercial sites for incineration of mixed wastes.

Q: Is management and treatment of mixed waste an alternative to land disposal? How much of the commercial mixed waste can be treated rather than disposed in a land burial facility?

A: Incineration of liquid mixed wastes is certainly an alternative. Unfortunately, no commercial radioactive waste incinerator designed and permitted to accept these wastes exists at present and only one commercial facility is presently burning liquids from scintillation vials. Evaporation and solidification may be an alternative, but is probably limited by costs to very small volumes. If incineration is judged to be the preferred course of disposal, national policy should enunciate this and facilitate the process of developing local, state and federal approval of new facilities.

Q: Will the EPA's revision of its RCRA facility operation and siting regulations affect the siting process for new low-level radioactive waste disposal facilities?

A: Revision of RCRA operations will certainly affect the siting process. States or regions may miss deadlines if they wait for EPA to develop siting regulations; or they may find that they have only an incomplete solution to the low-level waste disposal process if they make decisions in advance of EPA regulations. If the states or compact regions should make separate plans for mixed wastes, they should know that now and regulations (and the laws under which they are drawn) should explicitly assist this process.

QUESTIONS FOR DR. RICHARD C. REBA

DIRECTOR, DIVISION OF NUCLEAR MEDICINE
GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER

FROM SENATOR FRANK R. LAUTENBERG

Senator Lautenberg's questions pertaining to incineration technology and the statutes and regulations which apply to incineration are extremely important. We believe that mixed medical liquid waste can be incinerated under current technology with adequate protection of the human health and the environment. We would defer to the operators of these facilities and to EPA and NRC to respond to the detailed questions pertaining to operation of these facilities and the legislative/regulatory constraints.

We do not have detailed information on the quantities of LSV waste being produced in New Jersey. However, as New Jersey is a populous state with a large number of excellent hospitals with strong nuclear medicine and research departments, we would estimate that the LSV waste being generated by New Jersey would be greater than the state's percentage of the U.S. population. Certainly, every hospital in New Jersey with a nuclear medicine department will be generating some LSV waste. The volume of this waste cannot be reduced without suspending or cutting back on nuclear medicine diagnosis which is inseparably entwined with quality of medical care.

We believe that the majority of LSV waste from New Jersey is being shipped by brokers to Quadrex. For New Jersey, as for other states, dependence on one sole source of disposal is not prudent. Establishment of at least one national incineration facility, fully permitted under RCRA or other applicable laws, is essential to assure the continued provision of nuclear medicine procedures in New Jersey as elsewhere. RCRA permitting authority for both low-level land disposal and incineration facilities should also be delegated to NRC.

QUESTIONS FOR DR. RICHARD C. REBA

DIRECTOR, DIVISION OF NUCLEAR MEDICINE
GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER

FROM SENATOR ALAN K. SIMPSON

Q: Please provide your views on the Brookhaven survey of mixed waste completed late last year for the NRC. Is this an accurate and comprehensive survey of the types and volumes of mixed waste currently being generated in the commercial sector?

A: We believe the Brookhaven study provides an accurate picture of the mixed wastes being generated by the medical community. However, as noted in answer to other questions from the committee, some mixed wastes other than scintillation fluids are being generated by manufacturers of radiolabelled nuclides and by research facilities. While the quantities are not large, these wastes must be considered in resolution of the mixed waste problem, as they cannot at present be incinerated.

Q: Do you agree with the Brookhaven conclusion that approximately three percent of the total low-level waste is mixed waste, and that it comes primarily from three sources: (a) organic liquids associated with scintillation vials; (b) lead shielding; and (c) chromates from ion exchange resins used in power reactors?

A: We estimate the quantities of mixed wastes from the medical community, by extrapolation from the 1985 Report of the Conference of Radiation Control Program Directors and the Brookhaven report, at 35,000 cubic feet or about 1.2 percent of total low-level waste. This does not include lead shielding or chromates from ion-exchange resins used in power reactors, on which we do not have information. While it is correct that the majority of the medical mixed wastes are scintillation liquids, it is important to note that other medical mixed wastes, primarily liquid which result from the production of radiolabelled research compounds, are also being generated. As they cannot be burned at the single commercial facility now burning scintillation liquids, their disposal is a serious potential problem.

Q: The largest percentage of mixed waste appears to be the scintillation vials. Please comment on how the groups that you represent have disposed of these in the past, how you are disposing of them today, and what other options are presently available to you for the storage, treatment, or disposal of these vials?

A: Most of the scintillation fluids generated by the medical and research community, which in the past were disposed of at the Hanford site, are now being directed by brokers to Quadrex which crushes and separates the vials and then burns the resulting liquids in a cement kiln. This facility accepts only scintillation vials and scintillation liquids. In the case of C-14 and H-3, these must be at or below the NRC "de minimis" level. This is the only commercial facility incinerating these wastes.

While scintillation fluids represent the largest proportion of medical mixed wastes, these are also of concern particularly for medical research.

Q: Aside from disposal of mixed wastes in a low-level disposal facility, are there other options -- such as incineration or decontamination -- that might eliminate or minimize the need to dispose of mixed wastes, other than the scintillation vials that are currently being incinerated, in low-level waste disposal facilities?

A: The liquid mixed wastes, other than the scintillation vials already being burned, could safely be incinerated with only the ash or other dry residue subsequently buried. Unfortunately, the requisite commercial licensed and permitted incineration facilities do not exist at present, and the firms which have applied for permits to construct incineration facilities in the last several years have been denied the needed permissions. As a consequence, the major commercial manufacturer of radiolabelled compounds for research has been unable to identify a disposal source: no incineration facility licensed to incinerate these compounds now exists. One broker has informed us that it is treating some of the aromatic hydrocarbon wastes by evaporation and solidification and that the resulting wastes are being accepted for disposal at the Richland facility. However, the continued ability to solidify and subsequently to dispose of aromatic hydrocarbons from research institutions will depend upon decisions yet to come under RCRA.

Q: To what extent does our experience with the scintillation vials, and the current prohibition on their disposal, suggest that a prohibition on the disposal of mixed waste might actually have a positive effect of encouraging alternative treatment and management options?

A: The prohibition on disposal of scintillation vials at the Richland disposal facility had encouraged the alternate option of burning of scintillation liquids at one commercial facility which adds these liquids to the fuel at a cement kiln. However, as noted above, other liquid mixed wastes which cannot at present be burned in any incineration facility are accumulating at one radiopharmaceutical manufacturer and at several research facilities. Also, the one facility now burning scintillation liquids is the only one of its type. EPA has noted that this facility does not at present have a RCRA permit and may require one in the future. U.S. Ecology and Babcock and Wilcox are also having difficulty obtaining state permissions and RCRA permits for planned incineration facilities.

Development of alternate treatment in response to the closure of established sites is not good policy, particularly when hazardous wastes are, as a result, continuing to accumulate in temporary storage.

The United States should be taking a planned, constructive course toward solution of the mixed waste issue. To ban low-level burial of mixed wastes and hope alternatives appear encourages problem resolution through crisis. Just as a parachutist makes sure his parachute is secure before jumping out of the aircraft, we should know where we are going and when and whether the alternatives will be available.

Q: Is it going to be possible to break the logjam on the regulation of mixed waste disposal within the current statutory framework, or are we going to need to consider a change in the legislation to clarify the procedural and substantive responsibility for regulation of mixed waste disposal?

A: We believe these conflicts between EPA and NRC regulations and procedures will be resolved only if and when one agency is given authority and is directed to resolve these conflicts. As both EPA and NRC have testified that the chemical hazards are minimal and no chemical leaching has been found on the low-level radioactice disposal sites at which these mixed waste have been buried previously, we recommend that NRC be given this authority and directed to establish procedures for disposal of mixed radioactive and chemically hazardous wastes, under conditions satisfactory to RCRA and that NRC be directed to finish this task within six months, so that the states and regions now trying to develop sites will know what regulations they have to meet. If NRC judges incineration of these wastes to be possible and preferable to land disposal, it should be charged to develop regulations which will permit and facilitate the development of one or more national commercial sites for incineration of mixed wastes.

Q: If no changes are made legislatively and if, as it appears, the existing sites do not meet the requirements necessary to accept mixed waste for disposal, are we essentially faced with a situation today where all of this mixed waste is, in effect, already "orphan waste"?

A: As the medical mixed wastes which cannot now be incinerated at existing facilities are, as best we know, being safely stored at the radiopharmaceutical manufacturers or research facilities which produce them, they are not yet "orphan waste". However, extended "temporary" storage of hazardous chemicals at facilities which do not always have the storage space or the needed RCRA permits, is hardly wise policy. If the situation is not resolved, one can forsee that these will inevitably become "orphan wastes" at some point in the future.

Q: Would you support legislation to allow EPA to delegate its RCRA permitting responsibility to the NRC, to consolidate all permitting in a single agency for mixed waste?

A: We believe it would be appropriate for the Congress to delegate RCRA permitting authority for the establishment and regulation of mixed waste disposal to NRC. This delegation, to facilitate the establishment of one or more commercial incineration facilities, should

encompass the permitting of incineration as well as low-level land disposal sites. We would also support the delegation to NRC of authority for developing regulations and issuing permits required for the disposal of NARM and accelerator-produced radionuclides.

The NRC should be directed to permit disposal of mixed wastes at existing low-level sites under conditions compatible with Subtitle C of the Hazardous Waste Disposal Act pending establishment of such incineration facilities since the hazard potential from such an action would appear to be limited.

ENVIRONMENTAL POLICY INSTITUTE

STATEMENT OF DAVID BERICK

ON BEHALF OF

THE ENVIRONMENTAL POLICY INSTITUTE, THE SIERRA CLUB, AND THE NATURAL RESOURCES DEFENSE COUNCIL

BEFORE

JOINT SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE HEARING ON MIXED HAZARDOUS AND LOW-LEVEL RADIOACTIVE WASTE MANAGEMENT

MARCH 25, 1986

I am David Berick, Director of the Nuclear Waste and Safety Project of the Environmental Policy Institute(EPI). On behalf of the Institute, the Sierra Club, and the Natural Resources Defense Council, I wish to thank Senator Simpson and Senator Chafee and the members of their respective subcommittees on nuclear regulation and environmental pollution for the opportunity to testify on the management of mixed hazardous and low-level radioactive waste.

CLASS OF MIXED WASTE HAS NOT BEEN ADEQUATELY DEFINED IN PART DUE TO FAILURE TO IMPLEMENT RCRA

The issue of the management and regulation of mixed hazardous and low-level radioactive wastes(mixed waste) is a complex one. As with other industrial wastes, the types, sources, and characteristics of the general category of mixed waste are numerous. As is evident from the recently published studies by Brookhaven National Laboratory for the Nuclear Regulatory Commission(NRC), it is not entirely clear what wastes are truly mixed waste and which are not. The Brookhaven study, for example, noted that some lead shielding may be hazardous under EPA's EP toxicity testing procedures, but cited only a single scientific

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paper to this effect. The same could be said for DOE's recent and inconclusive efforts to have its individual materials production facilities characterize their wastes. DOE employed a variety of legal definitions to define mixed waste rather than physical characteristics.

For both commercial and DOE waste, RCRA places a burden upon the generator to ascertain whether a RCRA waste is being generated according to predetermined hazardous characteristics by using specific, well known, testing procedures under Subpart C of 40 CFR Part 261. While the question of RCRA application to mixed waste has tended to focus on its application to disposal sites, there maybe an even more serious failure to comply by generators.

(One issue we urge the Environment and Public Works Committee to pursue is the extent to which generators, including DOE, have been complying with Part 261 in determining whether wastes they generate contain hazardous constituents or possess hazardous characteristics.)

The lack of a comprehensive inventory and clear understanding of which wastes are mixed hazardous and radioactive wastes has confounded resolution of what technical problems exist in both commercial and defense waste streams. The lack of comprehensive inventory has exaggerated institutional and jurisdictional conflicts for both commercial and defense wastes because agencies have lacked a common data base or, in some cases, any data base from which to resolve regulatory issues.

INTERAGENCY CONFLICTS STEM FROM INSTITUTIONAL CONSIDERATIONS

The question before the Committee is a fundmental one--how to best assure that the management of waste materials which are both

hazardous and radioactive is conducted in a manner which provides the necessary protection to the public and the environment. This is not simply a matter of carving up jurisdiction between or among federal agencies. It is readily apparent that none of the three federal agencies--DOE, NRC, or EPA--in and of themselves currently possess the capability to adequately protect the public either in terms of regulations or resources.

It is apparent that very real enviromental and public health problems exist involving mixed waste at DOE facilities which are not being addressed. The record of environmental problems of management of the much smaller, more recently generated volumes of commercial mixed wastes would be expected to be less catastophic but not enough is known of current mixed waste management of commercial wastes to confirm that public health and safety and the evironment is or has been adequately protected. What the record does show, however, is that the Federal Government does not have anything approaching the type of comprehensive approach the problem requires.

DOE Mixed Waste---A Case of Institutional Paralysis

The problem of assuring adequate protection of the environment and the public from mixed waste is also compounded by the variety of jurisdictional relationships that have historically applied. Most notable of these has been the de facto exemption of DOE facilities from RCRA compliance. Not until April, 1984, when the U.S. District Court in LEAF, NRDC v. Hodel ruled that DOE was not exempt from RCRA, did DOE acknowledge the applicability of RCRA to its facilities. As discussed below, DOE

continues, in the so-called 'Byproduct Rulemaking', to seek an exemption from RCRA. (There has been a similar failure to fully apply RCRA to commercial mixed waste as documented in part by Brookhaven.)

The record of DOE management of hazardous and mixed wastes is abysmal and its practices may ultimately cost the taxpayers billions of dollars in clean-up costs. DOE's record of releases of two and a half million pounds of mercury and millions of gallons of acids and solvents at Oak Ridge, of inadequate disposal of millions of kilograms of mixed waste at Fernald, of evidence of severe groundwater contamination at Rocky Flats are a national scandal made worse only by DOE's continued resistance to fully comply with RCRA. It is clear that DOE cannot and should not be exempt from outside regulation in general and regulation by EPA under RCRA in particular.

(We urge the Environment and Public Works Committee to investigate the DOE's management practices of both mixed and hazardous wastes which simply on a scale of the number of sites and volumes of material would raise more than eyebrows if this were a corporate polluter.)

Nothing so clearly indicates DOE's view that it should continue a 'business as usual' approach as its proposal to exempt certain mixed wastes from RCRA by unilateral administrative action in the so-called 'Byproduct Rulemaking' (see 50 FR 45736-45738, November 1, 1985) irrespective of the level of non-radiological hazard posed by the wastes. (Attached are the comments of NRDC, the Energy Research Foundation, and EPI in this rulemaking which address this matter in more detail.)

Despite DOE's abysmal record and EPA's authority under RCRA to end such abuses, EPA has historically shown a reluctance to assert its regulatoy authority over DOE under RCRA. This must be brought to an end. Perhaps the most grievous example of this reluctance was EPA's execution of a 'Memorandum of Understanding' with DOE which not only took a hands-off approach but blocked the ability of states to enforce RCRA in EPA's absence. While this MOU was effectively struck down by the U.S. District Court in LEAF, NRDC v. DOE and while management has changed within EPA and must be given an opportunity to establish its own record, it should not take a federal court to initiate DOE compliance with RCRA and we remain skeptical that EPA will devote the necessary effort and resources.

If 'business as usual' continues with DOE's promulgation of a Byproduct Rule, Senator Glenn's bill, S. 897 is an absolutely necessary piece of legislation and barring an immediate rescision of that rulemaking S. 897 may well be necessary to make it absolutely clear to DOE and EPA that RCRA applies to hazardous and mixed waste at DOE facilities.

Parenthetically, it should be pointed out that current law clearly requires DOE compliance with RCRA and strictly speaking Sen. Glenn's bill would simply confirm this understanding. Sec. 1006 of RCRA provides that RCRA applies to DOE insofar as it does not result in regulation that is 'inconsistent' with the requirements of the Atomic Energy Act. RCRA also contains provisions, such as Sec. 6001 which provides for a temporary presidential exemption from RCRA requirements for

federal agencies, indicating Congress's recognition of the unique activities of such agencies, but confirming its intention nonetheless to apply RCRA. We emphasize that RCRA application to DOE is not tantamount to a preemption of the Atomic Energy Act as is often suggested.

Commercial Mixed Wastes

At first glance, the problems of commercial mixed waste would seem to be different from those at DOE facilities since commercial facilities are at least regulated under NRC authority whereas DOE is unregulated. It appears, however, that as in the case of DOE wastes the problems stem from an uncertainty over which wastes are mixed wastes and what controls are appropriate. Jurisdictional disputes between EPA and NRC have thwarted resolution of these technical issues.

The issue of commercial mixed waste has been unfortunately discussed almost exclusively in terms of regulatory 'turf' between NRC and EPA and complaints of overlapping or dual jurisdiction and concern over delays in EPA's promulgation of its full suite of RCRA regulations. While conflicts between EPA and NRC regulations may exist as they are formulated today, to date such conflicts have been largely conjectural since their joint application has been limited to the potential compliance of the U.S. Ecology site at Richland, Washington with the interim status requirements. There is no actual permitting experience upon which to determine whether the two sets of regulations would conflict when actually applied to a specific site or facility.

A case in point concerning the agencies' institutional inertia is the failure of EPA and NRC to develop a memorandum of

understanding concerning mixed waste. In testimony last fall before joint Senate Environment and Public Works and Energy Committee hearings, NRC stated that the failure to develop such an agreement stemmed from EPA's legal inability to delegate unilaterally its RCRA authority to NRC. It is truly inconceivable that faced with a clear legal impediment to one approach to an MOU that no other approach was taken nor agreed to by the two agencies over several years time.

To its credit, NRC initiated the Brookhaven studies to gain an understanding of scope of mixed waste problem. NRC should be applauded for taking this initiative to identify the technical issues involved and to give all of us a common basis for addressing this issue. As noted earlier, however, the burden of identifying mixed waste is not NRC's, nor the disposal site operators' nor in a strict sense even EPA's, but it is the generators who have the primary responsibility for determining whether they are generating mixed waste.

While the Brookhaven studies constitute an important data base from which to work , it is important to recognize that they come well after NRC's promulgation of its low-level waste disposal regulations in 1981. In our judgement, those regulations(10 CFR Part 61) do not adequately address the disposal of mixed waste. Consideration of hazardous constituents was not addressed in the proposed rule and the final rule contains an ineffective requirement that hazardous wastes be treated to the maximum extent practicable, 10 CFR Part 61.56(a)(8). Since treatment is generally not possible at the

time mixed waste arrives at a disposal site due to absorptive material, packaging, and mixing, and these steps are in fact encouraged by NRC regulation, the Part 61 hazardous materials provision is not readily applicable.

Let me stress that it is not in anyone's interest to attempt to apply inconsistent regulations which, in themselves, only deal with a part of the hazard. Rather what is needed is a comprehensive effort to formulate compatible NRC and EPA regulations specific to mixed waste---an exercise EPA must clearly conduct even in the case of DOE's illegal promulgation of the proposed Byproduct Rule for DOE mixed waste.

SEGREGATION OF MIXED WASTE WILL IMPROVE REGULATION AND REDUCE UNCERTAINTY OVER THE DEVELOPMENT OF NEW LOW-LEVEL FACILITIES.

In our view, development of mixed waste regulation must begin with the segregation of mixed wastes from the low-level waste stream. Such segregation is not only necessary to assure that mixed wastes can, in practice, 'be treated to the maximum extent practicable', but will in our view improve the performance of low-level disposal facilities. There is a growing consensus that a number of segregated mixed wastes can be effectively treated to limit or remove the non-radiological hazard. If selected mixed wastes are ultimately disposed of at a low-level waste disposal facility, this could be within a separate RCRA-permitted unit.

We remain skeptical of the arguments that delays in developing new RCRA regulations pursuant to the 1984 amendments will necessarily prevent states from complying the the 1985 Low-Level Waste Policy Amendments. Nothwithstanding questions concerning the constitutionality of the provision, States are not

obligated to physically provide disposal capacity of mixed waste under Sec. 3(d)(2)(C) of last year's amendments until January 1, 1996---a period seemingly long enough for appropriate mixed waste facilities to be provided. To the extent that there is concern over the possible impact of RCRA regulation delays, regulatory segregation of mixed waste would dispell the spectre of uncertainty concerning the length of time that RCRA rulemakings will take relative to the need to develop new low-level waste disposal sites. Although states maybe legally obligated to accept these segregated mixed wastes by January , 1996, they would not be obligated to accept them at the low-level waste facilities they are required to construct for the remaining low-level waste which comprises approximately 97% of low-level waste volume. Even without such segregation, States may ultimately not be bound to accept mixed wastes under the 1996 provision until the non-radiological hazard is removed.

We are also skeptical that EPA would have to develop the full complement of RCRA regulations prior to there being sufficient certainty concerning mixed waste. For example, the 1984 amendments require the phase out of land-disposal for hazardous waste. Even in the absence of complete RCRA regulations, I believe it is obvious that alternative treatment for certain mixed wastes is already apparent and is consistent with our recommendations for segregation.

CONSIDERATION OF ORPHAN WASTE

A primary concern with segregation of mixed waste is the possible creation of an orphan waste with no disposal capacity and in the worst case a candidate for illegal disposal. As noted

earlier, the three existing disposal sites have stopped accepting some or all mixed waste as a condition of their licenses and none comply with EPA interim status for RCRA---a condition unlikely to change. While this limitation on mixed waste disposal suggests the potential for disposal problems is already at hand, even an immediate blanket exemption of such sites from RCRA is unlikely to open those sites to all mixed wastes.

Mixed wastes, by their nature, raise questions of compatability with either the low-level waste system or the RCRA system. NRC, for example, requires a case-by-case examination of disposal of decontamination wastes containing chelating compounds under Part 61. I have long suggested that NRC address the chelating compound issue more precisely lest it become a major obstacle to the licensing of new disposal sites and it is clear that mixed wastes would remain an obstacle to the development of new disposal sites even in the absence of an apparent conflict with RCRA.

While some accommodation could be made during the interim, perhaps on a case-by-case basis for disposal of specific mixed wastes as part of the low-level waste system, it is apparent that both EPA and NRC must revise their respective regulations to address management, treatment, and disposal of mixed waste.

CONCLUSION

We believe that it is necessary to develop a comprehensive federal approach to the regulation of both commercial and defense mixed waste and one that assures that defense wastes are not subject to a 'double' and lesser standard of protection. EPA is

the federal agency with expertise and authority over hazardous wastes, and, in the absence of NRC jurisdiction, constitutes directly or through state programs the sole means of establishing independent regulation over DOE. As such, EPA is the logical 'lead' agency should this be necessary.

As noted, RCRA application does not preempt either NRC or DOE authorities under the Atomic Energy Act but is to be applied in parallel to those authorities. Notwithstanding DOE's effort to improperly expand its authority under the AEA to exempt certain mixed wastes, all three agencies--DOE, NRC, and EPA--have authority under existing law to manage and regulate mixed waste. Continued resistance, however, by DOE to submit to RCRA application, such as the proposed Byproduct Rulemaking, would require legislative intervention as Sen. Glenn has proposed.

NRC and EPA have adequate authority to require the segregation of mixed wastes and to develop mixed waste specific regulations. EPA must develop such regulations in any case to cover DOE mixed waste. Sec. 1006 would assure that NRC's AEA authority were not preempted and we would expect the two agencies to work together to coordinate their respective regulations.

Retention of dual EPA and NRC authority would assure the preservation of respective state authority where states have assumed primary regulatory responsibility under either RCRA or the AEA or both. Retention of dual authority would also assure that non-radiological and radiological hazards would be addressed and would not fall through the proverbial cracks as has occurred in the absence of the genuine exercise of those authorities.

TESTIMONY OF

SHERMAN NAYMARK

CHAIRMAN, QUADREX CORPORATION

BEFORE THE

JOINT SUBCOMMITTEE HEARINGS

OF THE

SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION

AND THE

SUBCOMMITTEE ON NUCLEAR REGULATION

OF THE

SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE

MARCH 25, 1986

QUADREX CORPORATION
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CAMPBELL, CA 95008

Mr. Chairman and members of the Environment and Public Works Committee, I am Sherman Naymark, Chairman of Quadrex Corporation. I am here at your invitation to testify as to Quadrex's participation in decontamination for disposal of "mixed wastes," and specifically liquid scintillation vials (LSVs) which are produced as part of the American medical industry's use of nuclear radioisotopes primarily in its research programs.

Quadrex is a publicly-held engineering and technical services company operating both nationally and internationally. We serve primarily the utility industry specializing in solving problems in areas such as engineering and technical support, computer-based analysis systems, and decontamination services. We also perform services for other industries. For example, our process for LSVs removes, to releasable limits, radioactivity and toxicity from the vials. This allows maximum flexibility for disposing of the glass or plastic vial containers in conventional sanitary land fills.

I testified at hearings of the combined Nuclear Regulation Subcommitte of the Committee on Environment and Public Works and the Energy Research and Development Subcommittee of the Committee on Energy and Natural Resources of the U. S. Senate held in Washington, D.C. on October 8, 1985. This testimony primarily covered Quadrex's business for decontamination of low-level radioactive metallic waste generated by the nuclear utility industry. At that time I briefly alluded to the work Quadrex is doing in decontaminating LSVs at our Gainesville, Florida facility. This testimony was amplified somewhat in my letter dated October 23, 1985 to Senator Domenici, Chairman of the Subcommittee on Energy Research and Development, regarding how we deal with mixed wastes such as scintillation vials (copy attached).

I am here today, in response to your invitation to cover somewhat more thoroughly our decontamination and disposal work on LSVs.

Liquid scintillation vials containing radioisotopes are generated primarily by biomedical research facilities. The waste products are contaminated with carbon-14 and tritium which comprise about 90% of the radioisotopes used in

this type of research. These radioisotopes and various others are carried in xylene and toluene solvents which are contained in glass and plastic vials. Radioisotopes are governed by NRC regulations, and toxic solvents by EPA regulations. Therefore, burial specifications for LSVs as well as other mixed wastes are governed by both agencies in those cases where the level of radioactive and toxic activity is above acceptable standards as set by these agencies. Eventual disposal of the used scintillation vials must meet the requirements of both agencies in burial, decontamination or storage.

The low-level radioactive waste disposal site at the Hanford facility in Richland, Washington, which heretofore had been the only authorized burial site for such vials, stopped accepting the scintillation vials in October of 1985. U.S. Ecology, Inc. who operates the site, announced that this act was taken because they could not comply with the conflicting regulations of EPA and the NRC.

Another method of handling the vials is to store them at the generating sites. This method is obviously limited by storage facilities and by the eventual requirement of disposal. A problem, of course, is the health hazard associated with the medium to long range storage of these substances.

A third method of handling the vials is to decontaminate them using procedures which are acceptable to the applicable regulatory agencies. Based on our data, Quadrex currently decontaminates approximately 70% of all the scintillation vials generated in the United States.

Quadrex receives LSVs from six of the seven major brokers collecting these vials from across the country. These brokers directly market the medical facilities and laboratories which create these mixed wastes. The process used by Quadrex mechanically crushes and screens the LSVs to separate the radioactive material and toxic xylene and toluene from the crushed glass and plastics. After rinsing with a proprietary solvent, the clean crushed glass/plastic is able to be buried without restriction in a conventional land fill site operating under local regulations. No federal regulation is necessary for these clean materials since these are neither radioactively contaminated nor contaminated with toxic materials.

The contaminated solvent is then burned in an approved rotary kiln facility which is not owned by Quadrex and is regulated by the State of Florida under EPA rules. Effluents from the kiln are monitored and are below EPA allowable discharge levels. Since there is no burial of the radioisotopes and toxics excepting for a negligible ash left over from the burning in the kiln, our disposal process is not in conflict with the EPA's R.C.R.A. requirements. We feel that our process is an ecologically sound one in that no radioactivity and toxicity need be buried thus avoiding the "mixed waste" burial dilemma.

As a part of our business planning we have compiled a summation of all the LSVs disposed of in the United States on an annual basis. Figure 1 shows our best estimate of the disposition of U.S. LSVs for a 12-month period from October 1984 to October 1985. We have classified the vials into two categories. "Exempt vials" do not require EPA/NRC joint regulations because the level of radioactivity is below the standard of concern. To the best of our knowledge, 58,000 cubic feet of such materials were handled during this period with about 75% decontaminated by Quadrex's Gainesville facility, and the other 25% handled by storage, burial in permitted land fill, or processed by others.

The second category, "regulated vials," fall within the EPA/NRC regulations for mixed waste. However, our processing method removes any radioactivity and toxicity before burial of the clean vial material. (For processing ease we handle both categories by the same process.) During the period in question, Quadrex processed 19,000 cubic feet of this material or about 60% of all that generated. Prior to closure of the Richland burial site to LSVs, about 6,500 cubic feet or 20% of the total generated was buried there. Storage or processing by others accounted for the remainder. We are certain of the quantity of materials that we handle and the quantity of these vials buried up to October 1985 have been reported by the operators of the burial facility. There is some uncertainty as to the amount stored or processed by a few of the facilities that also generate these vials, or others.

For the subcommittee's information, Quadrex can handle a significantly greater volume of LSV material annually than the 63,000 cubic feet which we

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processed during the 1984-1985 time period and including that amount previously buried or stored. In fact, it is interesting to note that one shipment of scintillation vials destined for burial at the Richland site in December 1985 was redirected to the Quadrex Gainesville facility for processing after Richland's closure. Thus it is reasonable to assume that most of the LSVs previously sent to Richland could be processed by Quadrex.

We believe that Quadrex has a complete, cost-effective and environmentally sound solution to the "mixed waste" problem as far as LSVs are concerned. Thus our Gainesville facility is responsive to serving the needs of the medical industry and the American public. At present the Gainesville facility is not handling any other "mixed wastes."

Our Oak Ridge facility primarily decontaminates metallic low-level radioactive wastes generated by the U.S. nuclear power generation industry. This material is not classified as a "mixed waste."

Your committee asked if Quadrex can handle "mixed wastes" at Oak Ridge. We have a proven process for removing suspended radioactive solids from oils which may become classified as a "mixed waste." We do not have an operational process for removing radioactive aqueous suspensions from oils. Thus, if oils are classified as toxic by EPA, we do not presently have an operational process for handling significant quantities of radioactively contaminated oils generated at nuclear plant sites. The "mixed waste" burial problem has also precluded us from developing a commercial process for removing radioactively contaminated lead bricks used in shielding.

Thank you for this opportunity to provide the information I have presented.

DISPOSITION OF

U.S. LIQUID SCINTILLATION VIALS

1984-1985 (12-MONTH PERIOD)

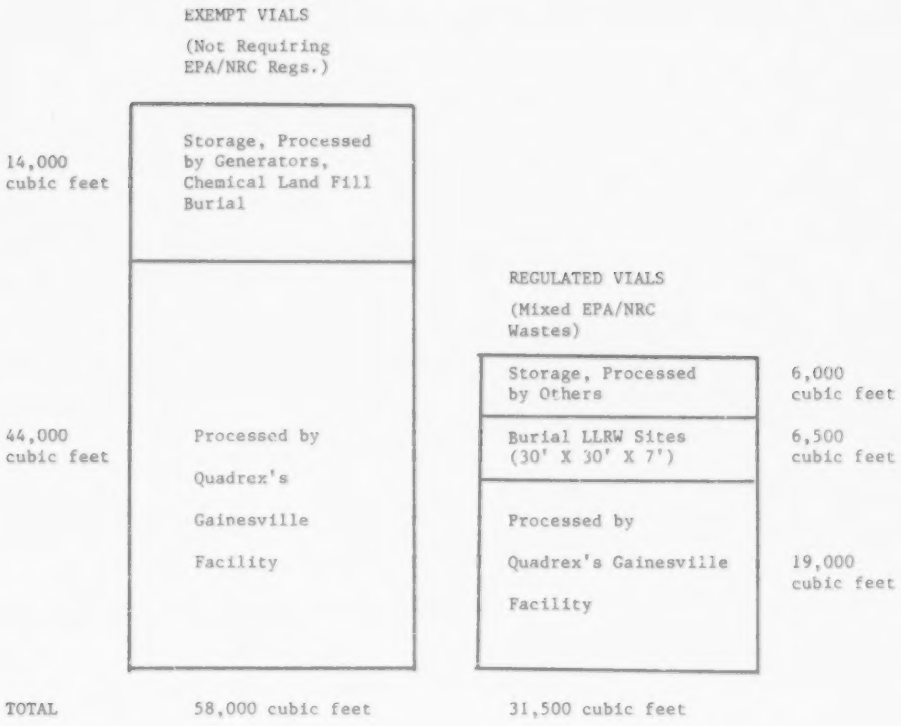

FIGURE 1

Quadrex Corporation

1700 Dell Avenue, Campbell, California 95008-6986
408-866-4510 TWX 910-590-2438 TELEX 35-2031 TELECOPY 408-370-4391

Sherman Naymark
Chairman

October 23, 1985

The Honorable Pete V. Domenici
Chairman
Subcommittee on Energy Research and
Development
Committee on Environment and Public Works
United States Senate
Washington, D.C. 20510

Dear Senator Domenici:

This letter responds to the two questions contained in your October 16, 1985 letter.

QUESTION 1

How does your recycling facility deal with mixed wastes such as scintillation vials? Are you regulated in any way by EPA's RCRA requirements? In processing and/or recycling scintillation vials or other wastes, do the hazardous waste remain with the radioactive wastes, or are they separated out to a different waste stream?

ANSWER TO QUESTION 1

Quadrex HPS Inc. operates a facility at Gainesville, Florida, which processes liquid scintillation vials (LSVs) to reclaim the flammable values of the toluene and xylene fluids for beneficial reuse. Quadrex receives liquid scintillation vials from brokers who directly market the medical facilities which create these mixed wastes. The process used mechanically crushes and screens the LSVs to separate the radioactive material and toxic xylene and toluene from the crushed glass and plastic. After rinsing with a proprietary solvent the crushed glass/plastic is able to be buried without restriction in a convenient land fill site. No regulation is necessary for these cleaned materials since it is neither radioactively contaminated nor contaminated with toxic material.

The solvent and toxic chemicals, including any radioactivity, are stored, and then burned in a rotary kiln facility. This facility is not owned by Quadrex but is regulated by the State of Florida and EPA. Since there is no burial of the radioactivity and toxicity excepting for a negligible ash left over from the burning in the kiln our disposal processes are not regulated by the EPA's RCRA requirements.

ATTACHMENT

Effluents from the kiln are monitored and are below EPA allowable discharge levels. There is no separate waste stream created from the radioactive waste and the toxic waste. We feel our process is a very ecologically sound one in that nothing need be buried thus avoiding the mixed waste burial dilemma.

QUESTION 2

I would assume that any waste recycled at your facility would be transported to the disposal site assigned to the original generator of such wastes.

a) How are these wastes identified and kept separate from another generator's wastes?

b) How does your suggested amendment language ensure that the recycled waste goes to the proper disposal site? It seems to me that your language gives you the ability to ship to any disposal site after you've processed the waste. Is that your intent?

ANSWER TO QUESTION 2

a. Quadrex operates an LLRW decontamination facility at Oak Ridge, Tennessee. This facility decontaminates and volume reduces metallic wastes received primarily from operating nuclear power plants. When Quadrex set up its management information system, in order to be able to accurately project and track costs, this system took into account client input by volume. Incoming shipments to Quadrex are thoroughly checked by our health physicists in order to assure that the shipping document accurately reflects the volume and amount of radioactive material received from each client. Each incoming shipment is assigned a client job number. The system tracks transfers from the storage yard to the production facility. Batch processing is performed on waste by client job order and a specific transfer is then made of both salvageable material and waste produced during the batch processing. The waste stream and the recycleable material are also tagged by the same incoming client job number.

b. The suggested amendment language does not address the issue of where the radioactive waste will go and to which of the disposal sites. It is possible, for example, for Quadrex to separate the radioactive wastes which are processed into three separate shipments, one for each of the now operating low level radioactive waste disposal facilities, which shipment would contain waste generated by utilities

assigned to that particular site with a listing of the waste amounts by client.

Quadrex believes that this is an inefficient way of handling the disposal of low level radioactive waste and has entered into discussions with the law firm of Sutherland, Asbill & Brennan, Washington, D.C., which firm represents the Governors of Nevada, Washington and South Carolina concerning low level radwaste waste burial.

Quadrex has proposed that the low level radioactive waste from all generators processed by Quadrex be consolidated into packages and buried in one of the three burial sites. An administrative credit arrangement will be given to the "nonused" burial sites. Quadrex would of course assure that the surcharges and allocations would be credited to the appropriate burial site based on the original generator of the radwaste.

This suggestion has been made for two reasons, 1) administrative economy and 2) to cut down on the number of transportable events which must transpire within any given year. The fewer the number of radioactive shipments, the more the transportation safety on the nation's highways. Wright Andrews, as attorney for the Govenors of South Carolina, Washington and Nevada, has been receptive to this suggestion. Discussions are underway with the Governors of the burial states regarding this matter.

However, Quadrex again will stress that it is possible to discreetly separate the radioactive waste product by assigned burial site should this prove to be necessary.

Very truly yours,

Sherman Naymark

SN:DEO:sp
DEO.109

bcc: N. Dudey
R. Hamilton
D. O'Reilly

Quadrex Corporation

1700 Dell Avenue, Campbell, California 95008-6986
408-866-4510 TWX 910-590-2438 TELEX 35-2031 TELECOPY 408-370-4391

Sherman Naymark
Chairman

April 30, 1986

The Honorable Alan K. Simpson
Chairman, Subcommittee on Nuclear
Regulation
Committee on Environment and
Public Works
United States Senate
Washington, D.C. 20510

Dear Mr. Simpson:

The enclosure responds to your letter of April 16, 1986 and the questions asked by various members of your committee. In some cases the questions asked are beyond the detailed knowledge of Quadrex and, therefore, we have declined to answer for this reason.

Sincerely yours,

Sherman Naymark

bh

Enclosures

QUESTIONS FOR SHERMAN NAYMARK, CHAIRMAN, QUADREX CORPORATION

FROM SENATOR ALAN K. SIMPSON

Q1. Please provide your views on the Brookhaven Survey of Mixed Waste, completed late last year for the NRC. Is this an accurate and comprehensive survey of the types and volumes of mixed waste currently being generated in the commercial sector?

A1. We have not studied the Brookhaven Survey of Mixed Waste in the detail required to comment as to its accuracy and comprehensiveness. However, the information we have on the volume of scintillation vial material does check rather closely with that implied in the study as to the amount and percentage of the total mixed waste generated in the commercial sector.

Q2. Do you agree with the Brookhaven conclusion that approximately three percent of the total low-level waste is mixed waste, and that it comes primarily from three sources: (a) organic liquids associated with scintillation vials; (b) lead shielding; and (c) chromates from ion exchange resins used in power reactors?

A2. Our information on organic liquids associated with liquid scintillation vials would indicate that its about two-plus percent of the volume of all low-level radioactive waste generated in the U.S. This checks fairly closely with the Brookhaven conclusion. We have no information on the volume of mixed waste from lead shielding and ion exchange resins.

Q3. The largest percentage of mixed waste appears to be the scintillation vials. Are you capable of handling all of the scintillation vials currently generated at your Florida facility, and what sort of changes have you seen, now that the low-level disposal site operators are no longer accepting scintillation vials for disposal?

A3. Quadrex is capable of handling practically all of the liquid scintillation vials currently generated by U.S. medical industry at our Florida facility. We have seen a larger volume of scintillation vials being sent to us after the burial site closed than before. However, this is only modestly larger because we were handling about two-thirds of all the vials before.

Q4. Aside from disposal of mixed wastes in a low-level waste disposal facility, are there other options--such as incineration or decontamination--that might eliminate or minimize the need to dispose of mixed wastes, other than the scintillation vials that are currently being incinerated, in low-level disposal facilities.

A4. We believe that there may be other options for handling mixed waste than burial in a low-level waste facility. However, because current regulations place an uncertainty on alternate disposal of mixed waste from development programs, we have decided not to undertake any sizable development to solve the problem because of concern that we might be left in the position of no place to dispose of the effluents from our development programs. I would imagine that other commercial companies would find themselves in the same position. Therefore, the present uncertainty in how such waste will be handled because of the failures of EPA and NRC to specify acceptable disposal criteria may inhibit finding alternate options.

QUESTIONS FOR SHERMAN NAYMARK, CHAIRMAN, QUADREX CORPORATION

FROM SENATOR ROBERT T. STAFFORD

Q1. Are mixed wastes now being disposed of or managed safely? Please explain.

A1. We are satisfied, as are also the responsible regulatory agencies, that the liquid scintillation vial mixed waste that Quadrex now handles is being disposed of and managed satisfactorily. Our process meets the regulatory requirements of the applicable agency. The method of disposal we use was described in my testimony.

Q2. If mixed wastes are now being disposed of or managed safely, is there a need for legislative or administrative action aimed at reconciling the NRC and EPA regulations governing land disposal of mixed waste?

A2. There is need for legislation and administrative action to reconcile regulations for land disposal of mixed waste so that development of effective and safe alternatives to burial can be undertaken by the commercial sector and/or by government agencies.

Q3. Are there any impediments to future disposal or management of mixed wastes in a safe manner? If so, what are they?

A3. See response to question 2.

Q4. Is management and treatment of mixed waste an alternative to land disposal? How much of the commercial mixed waste can be treated rather than disposed in a land burial facility?

A4. Our process for handling the scintillation vial waste is really one of management combined with the use of present technology. If the liquid scintillation vials prove to be a major part of the total mixed waste, then what we are doing with such vials provides a significant alternative to land burial.

Q5. Will the EPA's revision of its RCRA facility operation and siting regulations affect the siting process for new low-level radioactive waste disposal facilities?

A4. We are not in a position to comment on this.

QUESTIONS FOR SHERMAN NAYMARK, CHAIRMAN, QUADREX CORPORATION

FROM SENATOR FRANK R. LAUTENBERG

Q1 Are the current incineration technologies sufficient to ensure adequate protection of human health and the environment? If improvements are needed, at what stage(s) is(are) improvements needed, e.g., development, design, implementation or others?

A1. The handling of scintillation vial wastes involves incineration. Current technology is sufficient to ensure adequate protection of human health and environment. We are not in a position to comment on vial processes other than what we are doing.

Q2. How are incinerators of mixed wastes regulated, under what statutes and/or regulations, as disposal and/or treatment facilities? What permits and/or licenses are required?

A2. The incineration of scintillation liquids under our process does not comprise a mixed waste in that the radiation level is below that specified by NRC for a radioactive waste. Therefore the incineration is handled solely under regulations issued by the State of Florida pursuant to EPA rules.

Q3. What are the major toxic and chemical effluents? What is or should be monitored, what techniques are employed and how frequently is monitoring performed? What are the maximal amounts allowed in the effluents? What are the major contaminants in the ash?

A3. We are not in a position to comment.

Q4. Are more incinerators needed to effectively process liquid scintillation vials (LSV) nationwide? How much LSV mixed waste is being produced in New Jersey each year? Who are the major generators? Where is this LSV waste going?

A4. We do not believe that more incinerators are needed to process liquid scintillation vials nationwide. We also do not have detailed information on the amount of LSV mixed waste being produced in New Jersey since we get our LSV's from national brokers that combine material from many generators.

Q5. How has the LSV industry, vials, fluids and scintillators adjusted to the need to minimize this waste stream? How have industry's response reduced the volume of the LSV waste so far?

A5. This is more responsively answered by the LSV generators.

TESTIMONY OF
LEONARD C. SLOSKY
ADVISOR TO THE GOVERNOR OF COLORADO
TO THE
SUBCOMMITTEE ON ENVIRONMENTAL POLLUTION
AND THE
SUBCOMMITTEE ON NUCLEAR REGULATION
OF THE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
WASHINGTON, D.C.
MARCH 25, 1986

My name is Leonard C. Slosky. I am the Advisor to the Governor of Colorado for Science and Technology. I also am the Executive Director of the Rocky Mountain Low-Level Radioactive Waste Board. I appreciate the opportunity to share with the subcommittees some comments on the mixed waste issue.

MIXED WASTE - LOW-LEVEL RADIOACTIVE WASTE SITES

NRC Report NUREG/CR-4406.

To my knowledge, the U.S. Nuclear Regulatory Commission (NRC) report, An Analysis of Low-Level Wastes: Review of Hazardous Waste Regulations and Identification of Radioactive Mixed Wastes, is a reasonably accurate account of the mixed wastes which have routinely been shipped to the three commercial low-level radioactive waste disposal sites in recent years. However, there may be mixed wastes which this report did not identify. Unfortunately I do not have specifics to provide, but periodically I hear about generators who are in possession of unusual types of radioactive waste, such as radioactively contaminated PCB's, which they do not know how to dispose of. I would also like to emphasize that although the "special" mixed wastes identified in the NRC report -- decontamination solutions, degreasers, and miscellaneous solvents -- are small in volume, they are of concern because of their mobility in the environment and their ability to increase the mobility of radionuclides in low-level radioactive waste disposal sites.

Acceptance of Mixed Waste at Existing Facilities.
To my knowledge none of three existing low-level radioactive waste disposal sites are permitted by the Environmental Protection Agency (EPA) or through a delegated state hazardous waste agency to accept mixed wastes. Therefore the existing facilities do not knowingly accept such wastes. I do not think that Congressional action to prohibit these facilities from accepting mixed wastes until appropriate regulatory requirements are in place is necessary or prudent. Such a legislative prohibition could inhibit facility operators from obtaining a permit under the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.) (RCRA) or otherwise complying with the RCRA requirements for the disposal of mixed wastes.

Mixed Waste At Beatty, Nevada.
The low-level radioactive waste facility located near Beatty, Nevada is not permitted under RCRA nor is mixed waste knowingly accepted at the facility. Solidified liquids but not absorbed liquids are accepted at the Beatty facility. Wastes containing 0.1 percent (by weight) and less of chelating agents are accepted. Wastes containing one percent or more of chelating agents are required to be buffered by ten feet of dirt on all sides.

Options for Management of Mixed Wastes. There appear to be options other than disposal in a licensed low-level radioactive waste disposal site reasonably available for most scintillation liquids and other combustible liquids which are the largest category of mixed wastes. For example, the Systech Corp. has RCRA permitted cement kilns in California and Kansas which use deregulated scintillation fluids as part of their fuel. The technology of distilling scintillation liquids from their radioactive contaminants has also been demonstrated.

Legally, many scintillation wastes can be stored for decay and then disposed of without regard to their very slight radioactivity. However, many hazardous waste facilities which would otherwise accept such organic solvents, will not accept these materials because the hazardous waste facility operator considers them "radioactive" even though the NRC does not. The treatment and disposal of scintillation liquids containing isotopes with long (greater than 70 day) half-lifes remains a problem.

Much of the mixed waste scintillation fluid problem may be eliminated through the use of new scintillation liquids, now under development, which are not hazardous wastes under the RCRA.

My understanding is that most lead wastes can be reused or decontaminated and that most lead which is placed in low-level radioactive waste disposal sites is used to provide shielding during transportation and in the disposal site. The chromium wastes would appear to be amenable to treatment to render them non-hazardous.

Problems with the Dual Regulation of Mixed Waste. Our primary concern with the regulation of mixed wastes by both the NRC and the EPA is that the procedural and technical complexities of dual regulation will impede the development of new low-level radioactive waste management capacity in the U.S. This is of concern to the Rocky Mountain Region since we now host one of the three commercial low-level radioactive waste disposal sites in the nation. We are concerned that dual regulation could jeopardize the ability of the unsited regions and states to meet the milestones in the Low-Level Radioactive Waste Policy Act Amendments of 1985, P.L. 99-240. Closer to home, dual regulation greatly complicates Colorado's task in developing the new Rocky Mountain low-level radioactive waste disposal site. Even if the NRC and EPA regulations were not in conflict, the process of siting and permitting a regional low-level radioactive waste disposal facility is difficult enough without having to contend with two different permitting processes under the auspices of two different federal agencies.

With the NRC and EPA regulations in conflict, the establishment of new low-level radioactive waste disposal sites will be nearly impossible. Private firms will be hesitant to invest in developing a low-level radioactive waste disposal site as long as the facility is required to be designed to meet conflicting regulatory requirements. I am sure that others who are more expert in the technical aspects of the NRC and EPA regulations than I will be able to provide the subcommittees with a number of examples of the divergence of the two sets of regulations.

I would just mention two which seem apparent.

- Under RCRA, wastes are to be inspected and sampled to verify that the waste received is that described on the manifest. Under NRC the opening of waste containers and the handling of waste is discouraged to keep radiation exposure to personnel as low as reasonably achievable.

- RCRA requires liners and leachate collection systems below waste disposal units. The NRC regulations discourage liners and leachate collection systems.

I would like to raise another aspect of regulatory uncertainty in the establishment of new disposal facilities. The Rocky Mountain Compact, and perhaps a number of other regions and states, plan to dispose of naturally-occurring and accelerator-produced radioactive material (NARM) in their low-level radioactive waste disposal sites. Currently NARM waste is only regulated by the states. The Atomic Energy Act of 1954, as amended (42 U.S.C. 2011 et seq.) (AEA) does not authorize NRC to regulate NARM. While RCRA authorizes EPA to regulate NARM, to date, EPA has not issued regulations covering NARM. This is the uncertainty which concerns me. Following years of inaction at the federal level, EPA could issue NARM regulations in the middle of a state's site development effort or even after a new facility has begun operation, thus requiring very expensive retrofits, if technically possible. This is of particular concern in the Rocky Mountain region since, according to current projections, NARM comprises 97 percent of the waste which will be disposed of at the new Rocky Mountain low-level radioactive waste disposal facility over the next 20 years.

Recommendations for Developing Consistent Mixed Waste Regulations. In seeking to resolve the mixed waste issue, we should keep in mind two equally important goals: first, to have adequate facilities for the management of mixed wastes; second, to adequately protect public health and the environment while managing mixed wastes. On one hand, the NRC report demonstrates that mixed wastes pose hazards which 10 C.F.R. 61 does not

currently address. On the other hand, the vast majority of the low-level radioactive wastes for which the states are responsible contain no constituents which are hazardous under RCRA. The simple solution would be for the two federal agencies to sit down and come up with one consistent set of regulations to protect public health and the environment from the radiological and chemical hazards of mixed waste. I suspect that if we were not in Washington, D.C. the differences would have been resolved years ago.

Since we are in Washington, I will give my best bureaucratic suggestion. The Rocky Mountain Board has adopted the following position for resolving the mixed waste problem:

- EPA should be required to promulgate performance standards for low-level radioactive waste facilities which are consistent with 10 C.F.R. 61.

- There should be a consolidated permitting process which applies both NRC and EPA standards. NRC (or the appropriate agency of an agreement state) should be the lead permitting agency.

- State authorities over low-level radioactive waste facilities should not be preempted.

Resolution or Regulatory Conflicts within Existing Law. Resolution of the conflicts between the NRC and EPA regulations is complicated by the specificity of the RCRA statute. Regardless of whether NRC and the EPA have the statutory authority to resolve the differences in their regulations, it is apparent that they will not voluntarily do so.

One approach that could be explored would be to permit a separate RCRA disposal unit within an AEA licensed low-level radioactive waste disposal facility. Such an approach would be far from ideal from the states' perspective, but it may be one of the few viable options that can be implemented within the time frame of the Low-Level Radioactive Waste Policy Amendments Act of 1985, P.L. 99-240.

S. 1578 Approach to Mixed Waste. While the Environment and Pubic Works Committee approach to mixed waste has considerable merit, there are several concerns I would like to raise. The major concern is with the apparent preemption of existing state authorities. Section 11.(b) authorizes the NRC and EPA to determine if an AEA licensed or RCRA permitted facility can safely dispose of mixed waste. Such an approach does not recognize that many states are empowered to permit low-level radioactive waste and hazardous chemical waste facilities; nor does it recognize existing state authority to adopt and enforce more stringent requirements both under the AEA agreement state program and RCRA delegation. If Section 11(b) is intended to, in effect, retract delegated state RCRA and agreement state programs for facilities accepting mixed wastes, this would be unacceptable.

Section 11(c) establishes a process for applying portions of the RCRA regulations through the NRC licensing process. We strongly support this general approach. Section 11(c)(2) authorizes the NRC to adopt those portions of the RCRA regulations identified by EPA which NRC finds to be

consistent with the AEA regulations. We are concerned that this process may be doomed to failure because of inconsistencies in the regulations of the two agencies. Again this process also appears to preempt existing state authority over facilities accepting mixed wastes.

Section 11(c)(3) allows NRC to prohibit the disposal of mixed wastes where EPA identifies RCRA requirements which cannot be applied due to inconsistency. Such an approach, while logical from a regulatory standpoint, does not solve the states' problem since they remain responsible for providing for the disposal of such waste.

MIXED WASTE - DOE FACILITIES

Applicability of RCRA to DOE Facilities. Section 6001 of RCRA (42 U.S.C. 6961) is clear on its face that all agencies of the federal government, including the Department of Energy (DOE), are subject to the procedural and

substantive hazardous waste requirements of federal and state government. In this section of RCRA, Congress explicitly and unambiguously expanded the traditional application of environmental statutes to federal facilities. The application of RCRA to federal facilities has been affirmed by the United States District Court in LEAF, NRDC, v. Hodel, (586 F. Supp. 1163 (E.D. Tenn. 1984)).

Application of RCRA to DOE Facilities in Colorado. The U.S. government has operated the Rocky Flats Nuclear Weapons Plant near Denver, Colorado for about 30 years. Over the years a considerable amount of radioactive material released from the plant has contaminated the air, soil and public drinking water supplies off the plant site. During the last several years, the State of Colorado learned of over 15 waste treatment or disposal sites at the plant, some of which contain both chemical and radioactive wastes. The State has documented groundwater contamination which is believed to be caused, at least in part, by several facilities containing both chemical and radioactive waste.

Colorado, which in November 1984 received final authorization to operate its hazardous waste program in lieu of the EPA program, has sought to enforce federal and state hazardous waste regulatory requirements including the statutory requirement that interim status land disposal facilities submit a Part B permit application or closure plan. DOE has refused to submit a complete Part B application contending that the State does not have authority over mixed wastes. The State of Colorado has issued a Notice of Intent to Deny the incomplete DOE application. If Colorado decides to finalize this proposed action, Rocky Flats' interim status would be terminated and hazardous wastes could not be legally treated or disposed of at the plant. Colorado does not wish a confrontation with DOE, but the State has little choice when a hazardous waste generator fails to apply for the required permits, and contaminants from the facility are flowing towards a public drinking water supply.

DOE is asserting that EPA must revise the RCRA regulations to separately regulate mixed wastes. DOE further contends that before states can regulate mixed wastes at DOE facilities, EPA must specifically authorize states to

regulate mixed wastes. We find these assertions to be without legal basis and a clear and overt attempt to delay and obstruct regulation of treatment, storage and disposal of hazardous wastes at DOE facilities. If Congress had intended a separate regulatory scheme for mixed wastes I would think that the statute or at least the legislative history would have so indicated. I am unable to find any such indication. Unfortunately, EPA has agreed with this innovative interpretation of RCRA.

I would like to emphasize that this is not a procedural or bureaucratic feud. DOE contends that its internal controls over hazardous wastes are equivalent to RCRA. This is not the case. At the Rocky Flats Plant there are five unlined surface impoundments containing mixed wastes which are believed to be contaminating groundwater. DOE has refused to submit a permit application for these facilities to the State and has informed us that they have no intention of complying with the statutory mandate of installing double liners by 1988.

DOE wants the State to accept on faith that DOE has identified all facilities and activities at the Plant that are subject to RCRA. Despite the fact that State RCRA inspectors have obtained "Q" national security clearances they are not permitted to independently verify DOE's identification of areas which are subject to RCRA regulation.

The current situation of allowing the fox to guard the hen house must not be allowed to continue.

Comments on DOE's Proposed Rule on the Definition of Byproduct Material.

The DOE rulemaking to change the statutory definition of byproduct material is a further attempt to prevent regulation of the hazardous wastes generated at DOE facilities. The AEA and its legislative history are clear that only radiosotopes themselves are considered byproduct material, exempt from RCRA regulation. This rulemaking is so totally devoid of legal basis and logic that it does not merit further comment.

Congressional Action to Apply RCRA to DOE Facilities is Needed.

The State of Colorado strongly supports Congressional action to clarify that the transportation, storage, treatment and disposal of RCRA wastes are subject to regulation by EPA and authorized state agencies under RCRA regardless of whether such wastes contain or are mixed with radioactive material. We urge Congress not to allow EPA to delay the regulation of mixed wastes at DOE facilities for an unknown number of years while EPA is developing separate mixed waste regulations and state authorization procedures. The fact that DOE facilities are exempt from NRC regulation makes the immediate enforcement of RCRA requirements even more important.

S. 892 is a good piece of legislation which is headed in the right direction. We believe that the language of S. 892 could be tightened to prevent DOE from finding another loophole through which they may escape regulation.

I appreciate this opportunity to share my views on this important subject with you and would be happy to respond to any questions.

aamc association of american medical colleges

JOHN A. D. COOPER, M.D., PH.D.
PRESIDENT

April 10, 1986

202: 828-0460

Honorable Alan K. Simpson
Chairman
Subcommittee on Nuclear Regulation
Committee on Environment and Public Works
SD-415 Dirksen Senate Office Building
Washington, D.C. 20510

Dear Senator Simpson:

I am writing to you as President of the Association of American Medical Colleges (AAMC) concerning the disposal of "mixed" waste, i.e., waste that has both low-level radioactive and hazardous characteristics, according to respective NRC and EPA standards. The AAMC serves as a national voice for the 127 accredited medical schools and their students; the more than 450 major teaching hospitals in the United States; and over 80 academic and professional societies whose members are engaged in medical education, patient care, and biomedical research.

The present jurisdictional ambiguity and impasse over the proper legal and regulatory framework for the disposal of mixed waste is of enormous concern to the biomedical research and patient care community. These generators account for only about 4 percent of the total volume of shipped low-level radioactive waste, but, according to a recent Brookhaven National Laboratory report, they generate over 50 percent of the nation's mixed waste. This mixed waste comes in the forms of: liquid scintillation vials left after measurements of radioactive tracers used in biomedical research; and liquid wastes from the radioimmunoassay techniques used in patient care. Low-level wastes generated from research -- principally tritium, carbon-14, and iodine -- generally have long to very long half-lives. Without some means of disposing of all these wastes, essential health-related activities would have to be terminated. Such an outcome would clearly be antithetical to the public interest.

The current impasse over mixed waste has resulted in many AAMC institutions continuing to send their low-level radioactive waste to one of the three shallow land burial sites, while shipping their mixed waste -- generally, at a higher cost than other low-level waste -- to the handful of companies that will incinerate this waste. The requirement imposed on academic institutions and hospitals to process these two varieties of low-level waste by different mechanisms is a severe and unnecessary burden. The extra cost this entails comes on top of the substantial surcharges levied on generators in siteless regions, pursuant to P.L. 99-240. These surcharges will, of course, multipy over time. Mixed waste generators are also understandably concerned about having to rely on the very few processors of liquid scintillation vials.

The mixed waste stand-off not only adds administrative complexity and substantial costs to academic and patient care activities that employ radioisotopes, but threatens completion of the compact development process itself,

due to the uncertainty of licensing standards to be attached to new sites. In particular, the spectre that two agencies, NRC and EPA, will each be involved in licensing new sites is especially intimidating to would-be site developers.

The AAMC believes that mixed waste should be regulated solely by the NRC and disposed of at NRC-licensed sites. This arrangement will promote the safest, simplest and least expensive disposal of this type of waste. The legislature should also provide an explicit definition of mixed waste. The AAMC's justification for this position is as follows.

The NRC should regulate mixed waste because its radioactive properties are of far greater health and environmental concern than its hazardous characteristics. It follows that mixed waste should be disposed of at NRC-licensed sites. RCRA regulations and EPA should be consulted when the regulatory standards for mixed waste disposal are developed, but they clearly cannot be followed to the letter, since -- as the Subcommittee well knows -- these regulations conflict directly with NRC standards in a number of prominent areas. In addition, application of the full panoply of RCRA regulations to mixed waste would be time-consuming, expensive, and in some cases dangerous. In particular, it would be extremely difficult for academic institutions to classify the hazardous constituents of dry laboratory wastes.

The NRC's previous performance in overseeing disposal of low-level radioactive waste, including mixed waste, has been satisfactory; there is no evidence that damage to human health or the environment has resulted. The NRC-licensed low-level waste disposal sites are closely monitored for waste migration and other potentially dangerous occurrences; their very limited number makes it possible to impose rigorous standards. Alternatively, there are over a thousand licensed solid waste disposal sites, and their operators have no particular expertise in the disposal of radioactive waste.

The AAMC believes that the NRC should be given a strict timetable for the promulgation of standards on mixed waste. The present murkiness surrounding federal policy on this subject should be resolved with dispatch, so that institutions as well as low-level radioactive waste compact groups can move ahead with certainty.

Finally, in resolving the mixed waste dilemma, the Congress should provide a specific definition of mixed waste, as it did with low-level radioactive waste in P.L. 99-240. This action would delimit the universe of mixed waste and preclude any ambiguity over what categories of waste are to be regulated.

Thank you for your consideration of the AAMC's position on this issue. We believe that it provides a safe and workable framework for the disposal of mixed waste.

Sincerely,

John A. D. Cooper, M.D., Ph.D.

cc: Members of the Subcommittee on Nuclear Regulation

EDISON ELECTRIC INSTITUTE
UTILITY NUCLEAR WASTE MANAGEMENT GROUP
AND AMERICAN NUCLEAR ENERGY COUNCIL
STATEMENT FOR THE RECORD OF THE MARCH 25, 1986
JOINT NUCLEAR REGULATION SUBCOMMITTEE AND
ENVIRONMENTAL POLLUTION SUBCOMMITTEE
HEARING ON "MIXED WASTE"

The Edison Electric Institute (EEI), Utility Nuclear Waste Management Group (UNWMG) and American Nuclear Energy Council (ANEC) are pleased to submit the following statement for the record of the March 25, 1986 joint Nuclear Regulation Subcommittee and Environmental Pollution Subcommittee hearing on "mixed waste." EEI is the association of investor-owned electric utilities, whose members serve seventy-three percent of all ultimate electric utility customers in the nation. UNWMG is a group of forty-four publicly-owned and investor-owned electric utilities formed to monitor and assist in the resolution of nuclear waste management issues. ANEC represents more than one hundred organizations having an interest in nuclear power, including private, public and cooperatively-owned utilities, manufacturers, architect-engineers and firms performing various nuclear fuel cycle activities.

As the members of the Subcommittees are aware, efforts during the last Congressional session to clarify the regulatory responsibilities of the Nuclear Regulatory Commission (NRC) and Environmental Protection Agency (EPA) regarding waste containing both radioactive and hazardous components ("mixed waste") were unsuccessful, and provisions addressing the mixed waste issue were deleted from the Low-Level Radioactive Waste Policy

Amendments Act of 1985 (Amendments Act) prior to final passage. As a result, the regulatory regime in effect prior to passage of the Amendments Act remains in effect today.

That regulatory regime permits the full gamut of both radioactive and hazardous waste regulation to be applied to mixed waste, and does not establish a clear and reasonable division of responsibilities between NRC and EPA. The difficulty with this approach is that the NRC requirements for disposal of low-level radioactive waste differ markedly from the EPA rules for hazardous waste disposal, and are, in some respects, inconsistent. Additionally, some of the NRC and EPA requirements are duplicative. These problems are exacerbated by the manner in which EPA and NRC regulatory authority are delegated to, and implemented by, the various states. Thus, waste generators are concerned that they will be placed in the difficult position of being required to comply with these inconsistent and duplicative regulatory requirements. Furthermore, the absence of a clearly defined regulatory scheme could hamper efforts to develop new disposal sites in a timely fashion. NRC and EPA efforts to develop a memorandum of understanding that would clarify their responsibilities and address these problems have been unsuccessful.

Accordingly, EEI, UNWMG and ANEC favor Congressional consideration of this issue and the development of a legislative solution. While such a solution may conceivably take a number of forms, there are several basic principles that we believe should be included in any legislative resolution.

First, while some "mix" of regulatory responsibilities between the NRC and EPA seems essential, principal responsibility for administration (including enforcement) of appropriate regulations should be placed in one lead agency. While we do not oppose the "joint" identification of mixed waste, only one agency should be responsible both for determining what regulations will apply to such waste once it has been identified, and for issuing necessary permits or licenses. In order to permit appropriate consideration of the non-lead agency's views, the identification of applicable requirements could be subject to "consultation and due consideration" of those views (rather than concurrence), so that the lead agency may efficiently exercise its regulatory responsibility.

Second, we believe that the NRC should be designated as the lead agency, rather than the EPA. In most cases, mixed waste will likely be disposed of at low-level radioactive waste disposal sites. Accordingly, the NRC would be the most appropriate agency to perform the lead responsibility for regulation of such waste.

Third, we do not believe that a whole host of new regulations is required. On the contrary, in almost all cases, existing regulations and disposal practices should be sufficient to ensure the safe disposal of mixed waste. Accordingly, legislation should not require or create a presumption that new regulations will be necessary or that existing disposal facilities will not be sufficient to dispose of such waste. Thus, legislation might first require the identification of

specific disposal facilities at which specific wastes could be disposed of, and second, require development of new regulations or disposal facilities only in those limited cases (if any) where existing requirements and practices would not be sufficient.

Fourth, if any mixed waste is determined to be unsuitable for disposal in existing disposal facilities, it is essential that an appropriate disposal method be identified, and a responsible entity designated, in order to avoid creating additional "orphan" wastes.

Fifth, pending the development of any new regulations that may be required, generators should be able to continue to dispose of their mixed waste without being subjected to inconsistent or duplicative regulations.

Finally, we do not believe that the full panoply of both NRC and EPA regulation need be applied to mixed waste. The statutory duties of both agencies to protect the health and safety of the public can be accommodated without subjecting waste generators to an unreasonable, inconsistent and duplicative regulatory scheme.

EEI, UNWMG and ANEC support the Subcommittees' efforts and stand ready to assist you in any way appropriate.

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99TH CONGRESS
1ST SESSION

S. 892

To amend the Solid Waste Disposal Act to clarify the jurisdiction of the Environmental Protection Agency over the regulation of solid waste mixed with radioactive materials at Department of Energy Atomic Energy Act facilities.

IN THE SENATE OF THE UNITED STATES

APRIL 4 (legislative day, FEBRUARY 18), 1985

Mr. GLENN introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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A BILL

To amend the Solid Waste Disposal Act to clarify the jurisdiction of the Environmental Protection Agency over the regulation of solid waste mixed with radioactive materials at Department of Energy Atomic Energy Act facilities.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SHORT TITLE

SECTION. 1. This Act may be cited as the "Mixed Hazardous Waste Amendment Act of 1985".

FINDINGS

SEC. 2. The Congress finds that—

(1) the generation, transportation, treatment, and storage of solid waste mixed with radioactive material

poses potential hazards to public health and safety unless carefully planned and managed;

(2) the Department of Energy's Atomic Energy Act facilities are real or potential producers of such solid waste mixed with radioactive material; and

(3) the authority of the Environmental Protection Agency to regulate the disposal of solid waste mixed with radioactive material at the Department of Energy's Atomic Energy Act facilities should be clarified.

PURPOSE

SEC. 3. The purpose of this Act is to clarify the intent of Congress that the generation, transportation, treatment, and storage of solid waste mixed with radioactive material is subject to the Solid Waste Disposal Act, and that the disposal of solid waste mixed with radioactive material at Department of Energy Atomic Energy Act facilities, and at other facilities not licensed for the disposal of radioactive materials, is also subject to such Act.

CLARIFYING AMENDMENT TO DEFINITION OF SOLID WASTE

SEC. 4. Section 1004(27) of the Solid Waste Disposal Act is amended—

(1) by inserting "(A)" after "(27)";

(2) by striking out ", or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923)"; and

(3) by adding at the end thereof the following new subparagraphs:

"(B) Except as otherwise provided in subparagraph (C), the term 'solid waste' does not include source, special nuclear, or byproduct materials as defined in section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014).

"(C) The term 'solid waste' shall include materials described in subparagraph (B) when—

"(i) such materials are part of any mixture or combination, if the other constituent part of such mixture or combination is a 'solid waste' within the meaning of subparagraph (A), and

"(ii) such materials (I) are in the stage of generation, transportation, storage, or treatment, or (II) are disposed of at an Atomic Energy Act facility of the Department of Energy or other unlicensed location;

except that, this subparagraph shall not apply to wastes disposed of at a 'repository' as defined in section 2(18) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(18)).".

APPLICABILITY OF AMENDMENTS

SEC. 5. (a) This Act and the amendments made thereby are clarifying in nature with respect to the purpose stated in section 3, and shall not be construed as altering the intent of

Congress as to whether the Solid Waste Disposal Act, as in effect prior to the amendments made by this Act, applies to mixtures and combinations of solid wastes which contain radioactive material which are disposed of at facilities licensed by a State or by the Nuclear Regulatory Commission, or as altering the applicability of any standards or requirements issued pursuant to the Solid Waste Disposal Act.

(b) Nothing in this Act shall be construed to affect, modify, or amend the Uranium Mill Tailings Radiation Control Act of 1978.

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